Рентгеновские микроскопы VersaXRM 730, VersaXRM 615, Xradia 515 Versa, Xradia CrystalCT

Технические характеристики

По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70 **Казахстан** +7(727)345-47-04 **Беларусь** +(375)257-127-884 **Узбекистан** +998(71)205-18-59 **Киргизия** +996(312)96-26-47

эл.почта: zsf@nt-rt.ru || сайт: https://zeiss.nt-rt.ru/

ZEISS Versa X-ray Microscope Offerings

ZEISS Versa 3D X-ray microscopes support a broad spectrum of users across multiple fields at academic institutions, government research labs, industrial research and development, and manufacturing sites. These instruments expand the horizons of what researchers can learn about their samples. The most highly adopted X-ray microscope platform in the world is now available with greater flexibility in system configuration and software support to help you solve the challenges that change daily and to meet new opportunities head-on.

ZEISS Versa 3D X-ray Microscope Family

Features	VersaXRM 730	VersaXRM 615	515 Versa
Sealed Transmission, Fast Activation Source	30-160 kV, 25 W	30-160 kV, 25 W	30-160 kV, 10 W
Spatial Resolution [a]	450 nm	500 nm	500 nm
Resolution Performance [b]	500 nm		
Resolution Performance at a Distance [c]	700 nm @ 50 mm, 750 nm @ 100 mm		
Resolution at a Distance (RaaD) [c]		1.0 µm @ 50 mm	1.0 µm @ 50 mm
Highest Resolution Detector (optional)	40×-P	40×	40×
Control System	ZEN navx Navigation & Guidance	ZEN navx Navigation & Guidance	Scout-and-Scan
Filter Holder	Automated Filter Changer	Manual	Manual
On-system Viewer	3D View ZEISS edition	3D View ZEISS edition	TXM 3DViewer
Sample and Instrument Protection	SmartShield, SmartShield Lite	SmartShield, SmartShield Lite	SmartShield
Flat Panel Extension (FPX)	Optional	Optional	Optional
FAST Mode	Enabled; FPX required	Enabled; FPX required	
Autoloader	Optional	Optional	Optional
In situ Interface Kit	Optional	Optional	Optional
Advanced Features	WFM 4X, HART, DSCoVer		
Diffraction Contrast Tomography	Optional		
Advanced Reconstruction Toolbox			
High-performance Workstation	Included	Included	Optional
DeepRecon Pro	2-year license Included	2-year license Included	1-year or Perpetual license Optional
DeepScout	Optional	Optional	Optional
MARS	Optional	Optional	Optional
PhaseEvolve	Optional	Optional	Optional
OptiRecon	Optional	Optional	Optional
ART Packages			
AI Supercharger	Upgrade	Upgrade	Optional
Recon Package	Upgrade	Upgrade	Optional
Artifact Reduction Package	Optional	Optional	Optional
ART Premium	Upgrade	Upgrade	Optional

[a] Spatial resolution measured with ZEISS XRM 2D resolution target, normal field mode, optional 40×-P (730) or 40x (615, 515).
[b] Resolution performance measured with ZEISS XRM 2D resolution target, normal field mode, optional 40×-P objective.
[c] RaaD working distance is defined as clearance around axis of rotation (sample radius). Resolution is measured with ZEISS 2D resolution target.

ZEISS

Seeing beyond

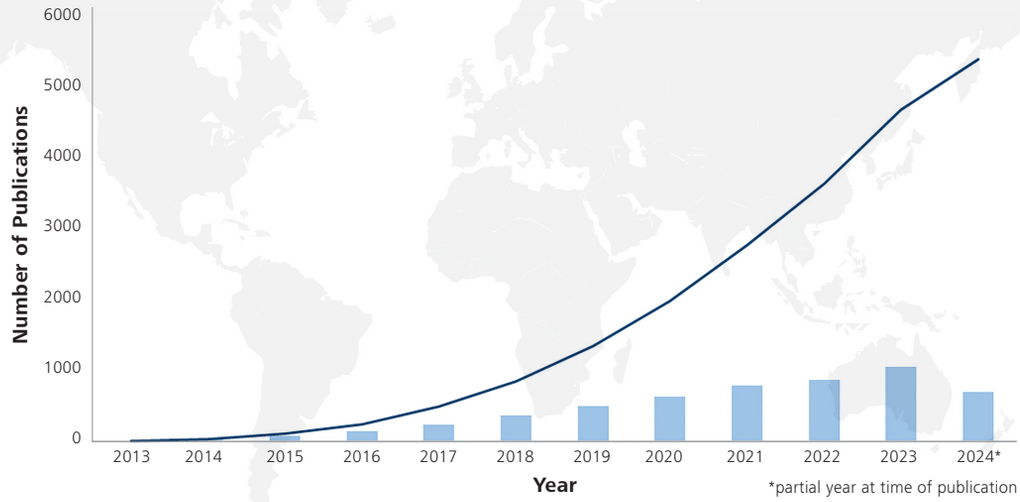
Versa: The World's Most Proven X-ray Microscope

42+
Countries publishing Versa XRM papers

3
On average, new ZEISS Versa XRM publications ***every day***

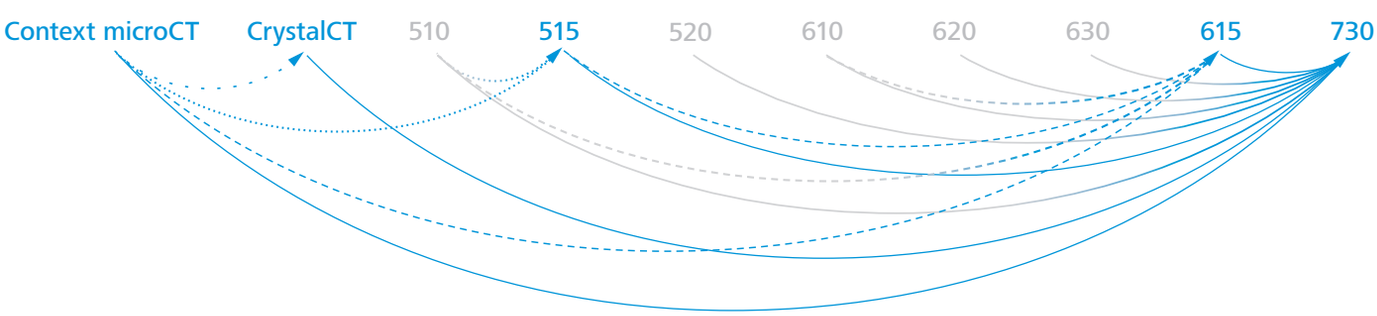
6000
Versa XRM publications ***and counting…***

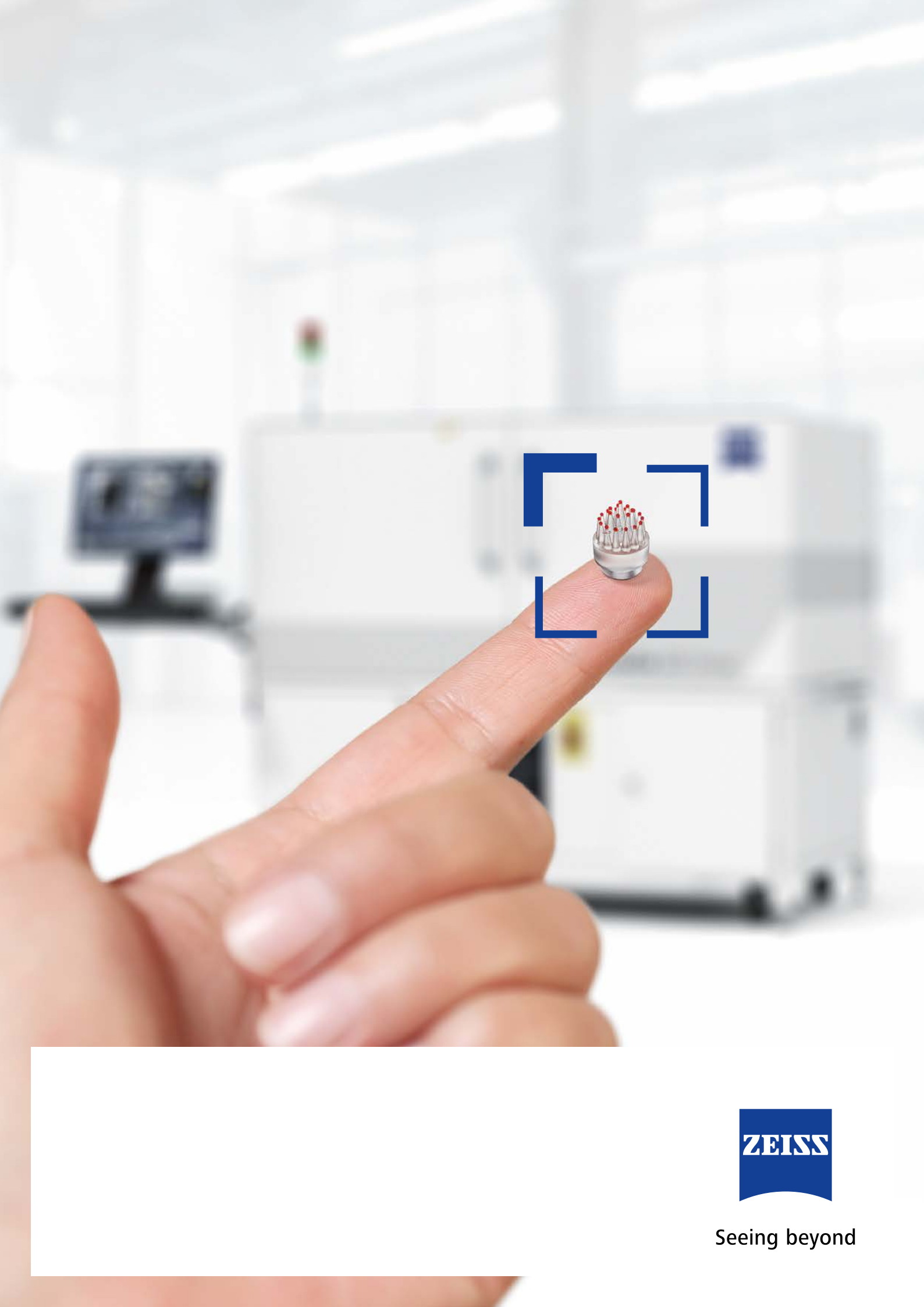
400+
Unique institutions listed as authors or co-authors



Protect Your Investment

ZEISS X-ray microscopes are designed to be upgradeable and extendable to future innovations and developments so that your initial investment is protected. This ensures your microscope capabilities evolve with the advancements in leading technology, a key differentiator in the 3D X-ray imaging industry.





ZEISS

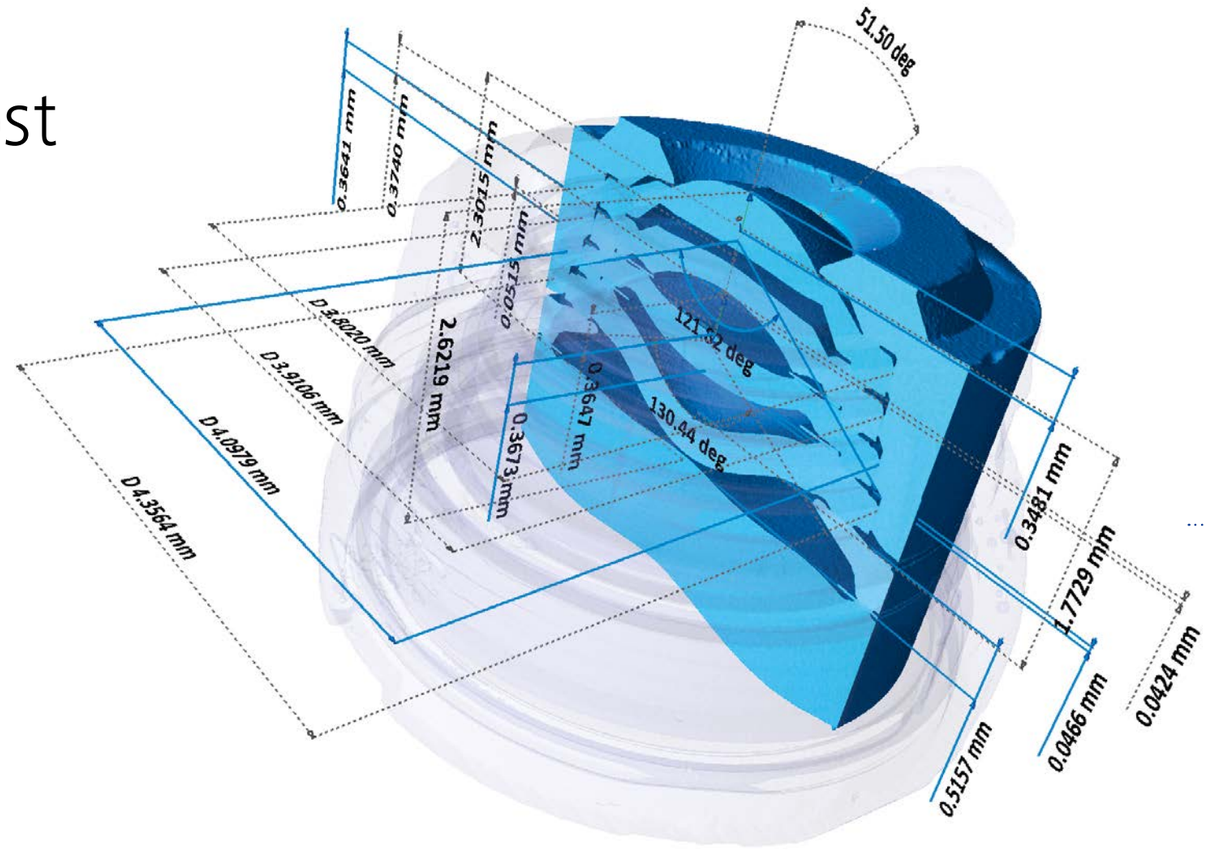
Seeing beyond

Reveal smallest dimensions.

Measure them most accurately.

Adding measurement accuracy to X-ray microscopy.

Metrology Extension for ZEISS Xradia Versa



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

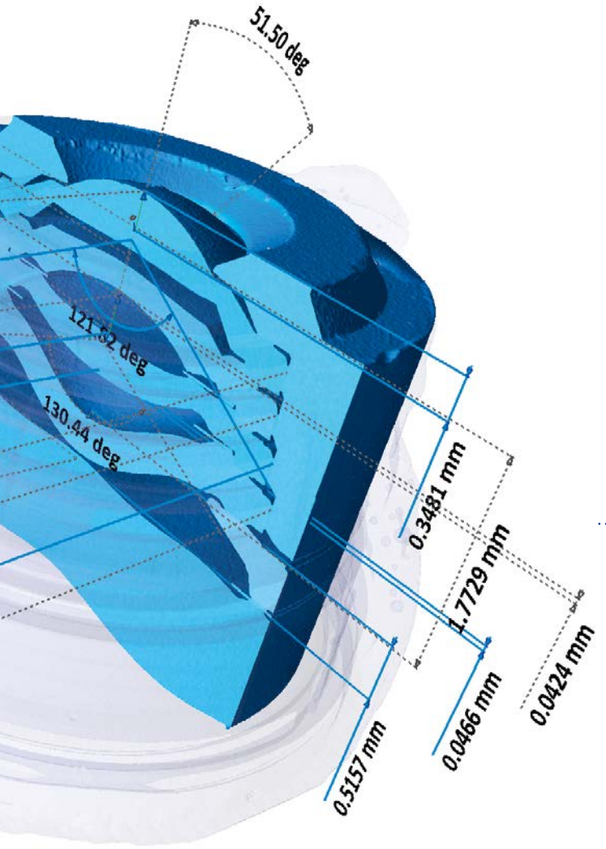
Unlike conventional Micro-CT solutions, ZEISS Xradia Versa provides high-resolution imaging of small volumes inside larger samples, even when performing *in-situ* and 4D investigations. The MTX package compliments this offering by enabling measurements at high dimensional accuracy within small reconstructed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



- 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.

Move the limits of your applications.
Deliver traceable results.

Smartphone camera lens assembly

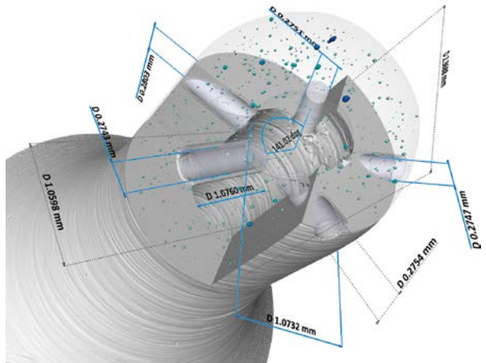
In the assembled state of smartphone camera lens modules, the assessment of geometrical properties requires a non-contact and non-destructive measurement method to quantify relational parameters. Metrology Extension for ZEISS Xradia Versa allows the accuracy-verified measurement of properties like

- **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.

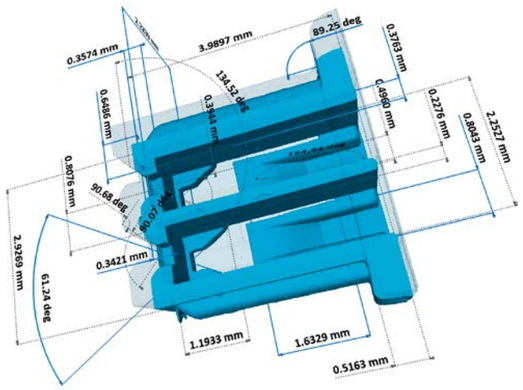
Tip of a fuel injector nozzle

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.



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).



Speci ications
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)

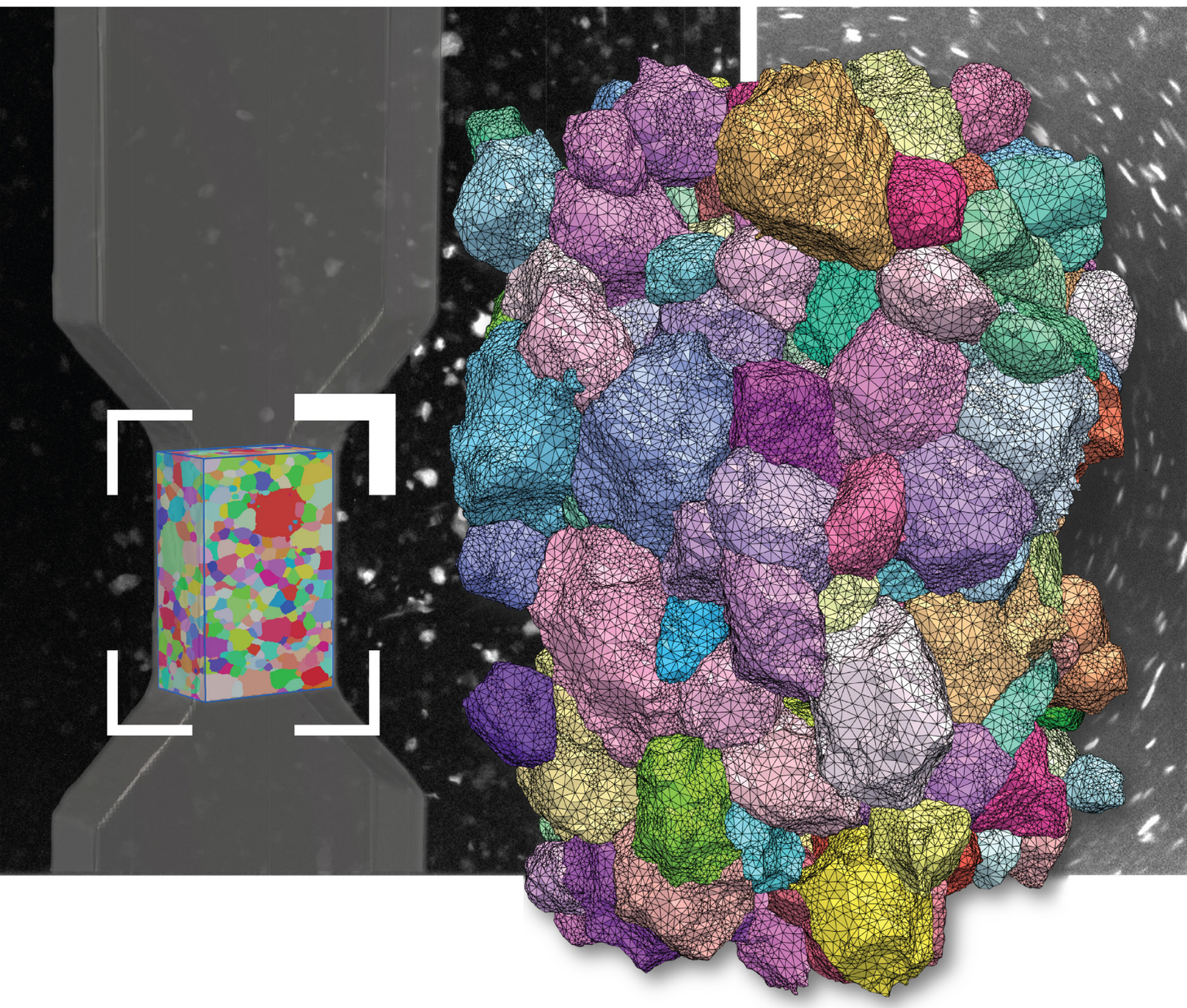
Software	
Operating Software	Scout-and-Scan Control System for ZEISS Xradia Versa
Operating System	Microsoft Windows 10
Further data processing	ZEISS CALYPSO

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 ≈ 0.55 x 10^{-6}/K)
Calibration uncertainty	Reference calibration data with an uncertainty of U (k=2) < 0,150 µm.

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
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

Diffraction contrast tomography in your lab.



LabDCT Pro on ZEISS VersaXRM 730

Product Accessories

ZEISS

Seeing beyond

LabDCT Pro on ZEISS VersaXRM 730

Diffraction contrast tomography in your lab.

Unlocking crystallographic information in your lab

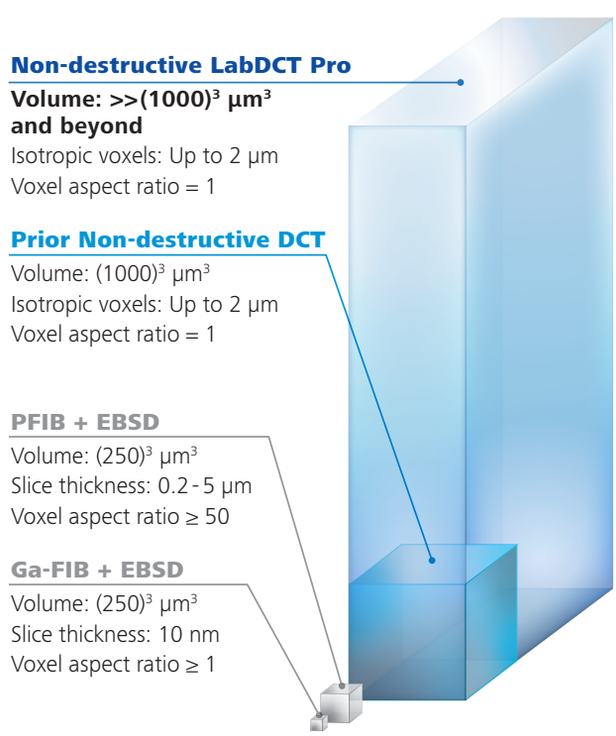
With LabDCT Pro, ZEISS brings you the most advanced capabilities in laboratory-based diffraction contrast tomography. This unique grain imaging analytical technology enables non-destructive mapping of orientation and microstructure in 3D. No longer confined to conventional 2D metallography investigations, direct visualization of 3D crystallographic grain orientation opens a new dimension in the characterization of metal alloys and polycrystalline materials. LabDCT Pro not only enables 3D grain mapping on the objective-based detector system of your ZEISS VersaXRM 730, the imaging module now extends grain mapping capability to the flat panel detector. In combination with DCT advanced acquisition schemes, the high throughput and large detector area of the flat panel allows you to acquire crystallographic data on larger, representative samples.

4D grain map of an Armco iron sample imaged at various annealing steps. t0: initial state; t1: after annealing at 880 °C for 8 hrs; t2: after annealing at 880 °C for 16 hrs. By imaging the sample at three temporal states, the abnormal grain growth of the top, pink-colored grain is captured. Courtesy of Prof. Burton R. Patterson, University of Florida, United States.

Benefits

- Combine 3D grain orientation with 3D microstructural features such as defects or precipitates you have observed in tomography: you will see new possibilities for characterizing damage, deformation, and growth mechanisms.
- Achieve truly representative sample volumes. New innovative DCT scanning modes in LabDCT Pro enable scanning large samples with irregular geometries.
- Complement your grain imaging with 3D grain morphology: routinely acquire grain statistics on larger volumes at faster acquisition times. Crystallographic information provided by LabDCT Pro lets you supplement other analyses like EBSD or synchrotron methods – or even to couple with modeling.
- Investigate microstructure evolution with 4D imaging experiments: LabDCT Pro extends metals research to 3D – and on to 4D with routine tool access for longitudinal studies such as corrosion. Being able to expose your samples to environments in the microscope across days, weeks or even months is a unique strength of laboratory-based XRM experiments compared to the synchrotron.

3D grain map of an Armco iron sample. Half the sample volume is removed to reveal inner grain (small clusters). Faces of a selected grain (left to right): by IPF color, grain boundary normal direction in crystal reference system, misorientation to neighboring grains, and grain boundary curvature.

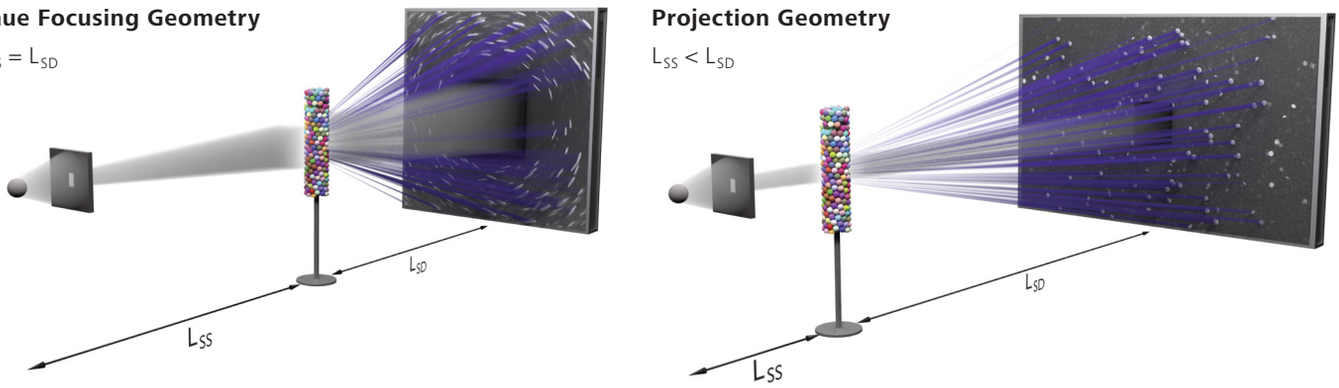


Laue Focusing Geometry

$L_{SS} = L_{SD}$

Projection Geometry

$L_{SS} < L_{SD}$

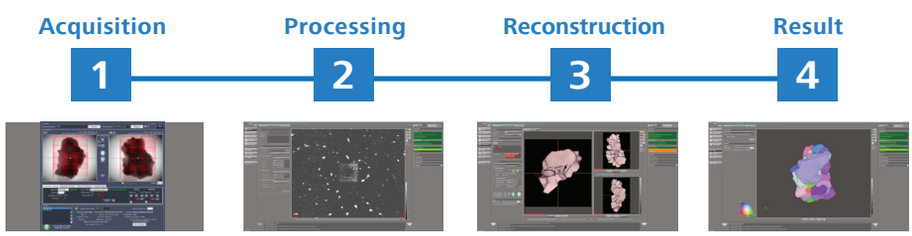


Schematic illustration of LabDCT Pro. Left: Laue focusing geometry on the DCT 4X objective. Right: Projection geometry using the flat panel detector. Exemplifying sample is sapphire spheres stacked in a glass tube.

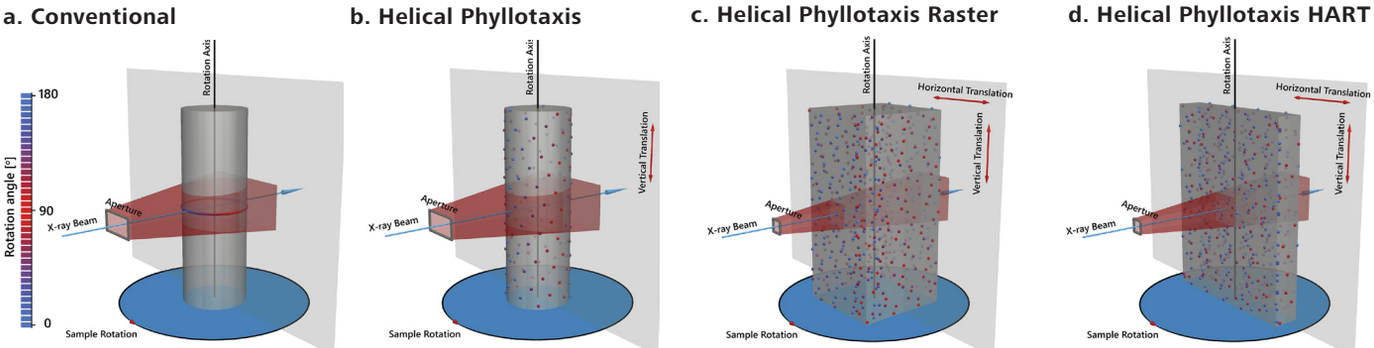
LabDCT Pro is a fully integrated module for the ZEISS VersaXRM 730 X-ray microscope. The sample is illuminated through an aperture in front of the X-ray source. Both the sample absorption and diffraction information are recorded with a high-resolution detection system. 3D grain maps comprising information about grain orientations, morphologies and boundary networks, are reconstructed using GrainMapper3D™ software by Xnovo Technology. Data is exportable in an open data format suitable for additional investigation using custom analysis software or simulation tools.

ZEISS LabDCT Pro Analysis with Xnovo GrainMapper3D

- Workflow-based analysis, to guide and increase the productivity of the non-expert user
- Histogram-based parameter selection
- Instantaneous preview of reconstructed grains to optimize parameter selection
- Interactive 3D view with coloring options for orientation and map fidelity
- Easy export of data into an open format for subsequent analysis, i.e., HDF5



a. Conventional **b. Helical Phyllotaxis** **c. Helical Phyllotaxis Raster** **d. Helical Phyllotaxis HART**



Schematic illustration of (a) the conventional DCT scanning mode and three advanced DCT scanning modes: (b) Helical Phyllotaxis, (c) Helical Phyllotaxis Raster and (d) Helical Phyllotaxis HART. Points on sample surface mark the position where the center of the beam intersects with the sample surface for an individual diffraction projection, colored by the rotation angle of the sample.

Scan modes	Conventional	Helical Phyllotaxis	Helical Phyllotaxis Raster	Helical Phyllotaxis HART
FOV vs ROI	ROI fits in FOV	ROI taller than FOV	ROI larger than FOV	ROI larger than FOV
Rotation stepping	360°/N	137.5°	137.5°	137.5°
Vertical translation	No	Yes	Yes	Yes
Horizontal translation	No	No	Yes	Yes – adaptive

Overview of conventional and advanced scanning schemes along with the associated stage motions

Crystallographic Grain Imaging (X-ray Diffraction Contrast Tomography), powered by Xnovo Technology	
Grain Detectability, Orientation Angular Rotation	20 µm, 0.1°
Crystal Symmetries	Cubic, Hexagonal, Trigonal, Tetragonal, Orthorhombic, Monoclinic and Triclinic
DCT Acquisition Modes	Helical Phyllotaxis-Scanning, Helical Phyllotaxis-Raster, and Helical Phyllotaxis-HART

	ZEISS VersaXRM 730 with FPX and LabCT Pro	ZEISS Xradia CrystalCT
Type of X-ray solution	X-ray microscope with Resolution at a Distance (RaaD) with Performance	microCT on the **ZEISS** Versa platform
Diffraction Contrast Tomography		
High resolution, Laue focus mode diffraction contrast tomography, DCT-4X scintillator coupled detector	■	
Large field of view, high throughput, projection mode diffraction contrast tomography, flat panel detector	■	■
Advanced DCT acquisition modes enabling large volume sample representivity	■	■
Xnovo GrainMapper3D, DCT reconstruction and visualization	■	■
Dedicated DCT reconstruction workstation, Dual NVIDIA CUDA-based GPU, 128 GB RAM, Multi-Core CPU, 27" 4K display monitor	■	■
ZEISS Versa *Protect Your Investment*	Upgradeable	Upgradeable to VersaXRM 730 with FPX and LabCT Pro
X-ray Source		
Type	Spot Stabilized, Sealed Transmission	
Tube Voltage Range: 30 – 160 kV	■	■
Maximum Output	25 W @160 kV	10 W @160 kV

Applications

- Metals and alloys (automotive, aerospace, nuclear, biomedical, electrochemical, and additive manufacturing applications)
- Grain growth and recrystallization
- Ceramics and abrasives
- Energetic materials
- Semiconductor materials
- Non-destructive correlation to 2D/3D EBSD or optical methods
- Large statistical input for computational models

Benefits

- Non-destructive 3D X-ray imaging
- Absorption and diffraction contrast imaging
- Best-in-class resolution and image quality
- Crystallographic grain structure characterization
- Large field of view imaging with fast scan times
- Industry-leading 4D and *in situ* capabilities for flexible sample sizes and types
- Continuous access to advanced reconstruction technologies such as OptiRecon and DeepRecon for enhanced performance (e.g., throughput, image quality)
- Field convertible

Class-leading resolution at a distance.

ZEISS Xradia 515 Versa

The workhorse for your research facility.

ZEISS

Seeing beyond

Breakthrough Flexibility for 3D Submicron Imaging

› **In Brief**
› The Advantages
› The Applications
› The System
› Technology and Details
› Service

Achieve new degrees of versatility for your scientific discovery and industrial research with ZEISS Xradia 515 Versa, an X-ray microscope workhorse for your modern analysis laboratory. Leading researchers and scientists across the world rely on the signature Resolution at a Distance (RaaD) capability of ZEISS Versa XRM, ensuring high resolution is maintained across longer working distances, to produce remarkable scientific insights and discoveries. Combined with powerful contrast and 4D / *in situ* capabilities for diverse sample sizes, types, and research requirements, the flexible ZEISS Versa XRM platform delivers utility and a fast time to results for your lab.

ZEISS Xradia 515 Versa: Flexible. Innovative. Non-destructive.

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Defining XRM: "Versatile"

Non-destructive X-ray imaging preserves and extends the use of valuable samples over time. Harness the power of X-ray microscopy (XRM) with ZEISS Xradia 515 Versa using flexible 3D imaging for a wide range of samples and research environments. ZEISS Xradia 515 Versa achieves 0.5 µm true spatial resolution with minimum achievable voxel size of 40 nm. Experience versatility for soft or low-Z materials with advanced absorption contrast along with innovative phase contrast to overcome the limitations of traditional computed tomography approaches.

Achieve Performance Beyond Micro-CT

Extend scientific research beyond the limits of projection-based micro- and nano-CT systems with ZEISS Versa XRM solutions. Where traditional tomography relies on a single stage of geometric magnification, ZEISS Xradia 515 Versa features a unique two-stage process based on synchrotron-caliber optics. Multi-length scale capabilities enable you to image the same sample across a wide range of magnifications. You will also find that ZEISS Xradia 515 Versa is easy to use by everyone in your busy lab. Accelerate post-processing and image segmentation tasks using advanced machine learning with ZEISS ZEN Intellesis. Boost throughput and image quality with ZEISS DeepRecon Pro and DeepScout, advanced reconstruction technologies leveraging artificial intelligence and iterative algorithms.

Choose the Industry's Premier 4D / *In Situ* Solution

Uniquely characterize the microstructure of materials in their native environments and study the evolution of properties over time (4D). Breakthrough Resolution at a Distance (RaaD) enables unprecedented lab-based exploration for a diverse array of applications and sample types, and under varying conditions, in high precision *in situ* rigs. The Versa *In Situ* Kit allows you to optimize set-up, makes operation easy, and provides a faster time to results.

Your Insight into the Technology Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

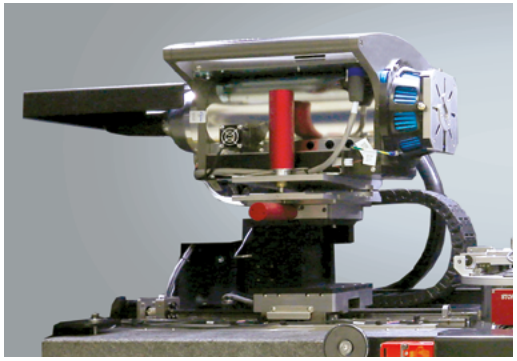
3D X-ray Microscopy

Your research requires three-dimensional insight into subjects in their native states, and as they evolve over time. World-leading research facilities, universities, synchrotrons, national, and private labs have deployed XRM to meet the growing need for flexible 3D and 4D imaging at high resolution. ZEISS Xradia 515 Versa now makes this caliber of research even more practical for mid-sized imaging centers and industrial laboratories.

X-ray microscopy plays the vital role in your imaging workflow of delivering high resolution and contrast while preserving your valuable samples for future use. Adding a non-destructive stage to the traditional workflow complements your electron and optical microscopy capabilities, easily identifying regions of interest for further study.

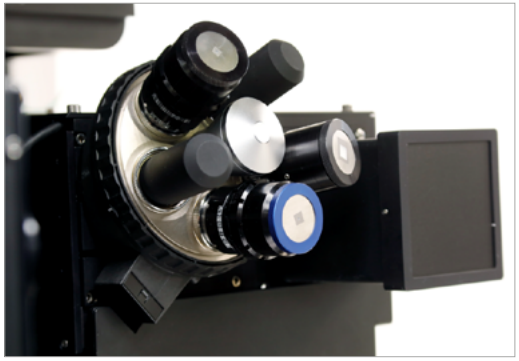
ZEISS Versa XRM solutions employ sophisticated X-ray optics developed for synchrotrons and a unique system architecture. Along with superior resolution and contrast, you will achieve unique multi-length scale imaging, and experience flexible working distances and workflow efficiencies for a wide array of applications and samples.

XRM Source



Additionally, ZEISS Xradia 515 Versa uses highly optimized sealed transmission X-ray source technology. Sealed sources mean higher vacuum and longer filament life—eliminating costly, time-consuming, and error-prone frequent filament changes that are required in lower vacuum open source microCT systems—enhancing source stability and lifetime, while providing consistent performance.

XRM Detector Technology



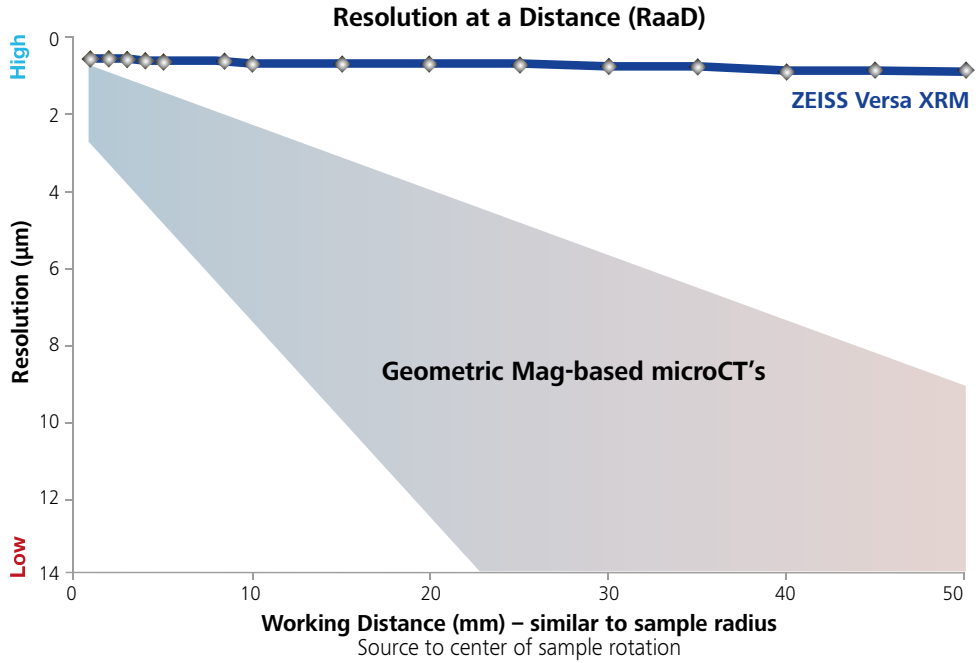
Your Insight into the Technology Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

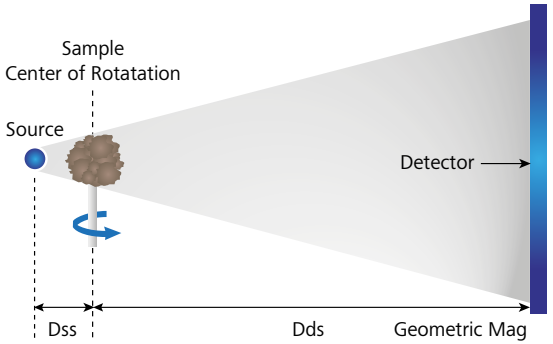
ZEISS XRM: Architected for Your Advantage

Use the two-stage magnification technique offered by ZEISS Versa XRM to uniquely achieve RaaD, which enables you to effectively study the widest range of sample sizes, including those within *in situ* chambers.

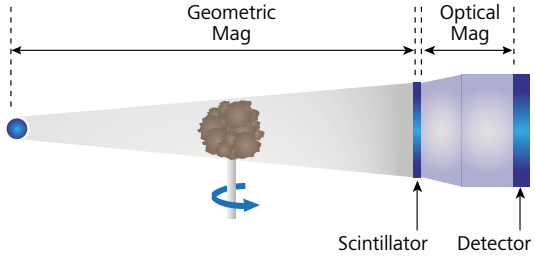
Your sample images are initially enlarged through geometric magnification as they are in conventional micro-CT. In the second stage, a scintillator converts X-rays to visible light, which is then optically magnified. Reducing dependence upon geometric magnification enables ZEISS Versa XRM solutions to maintain submicron resolution down to 500 nm at large working distances.



High resolution is maintained for large samples



Conventional Micro-CT Architecture



ZEISS XRM Two-stage Magnification Architecture

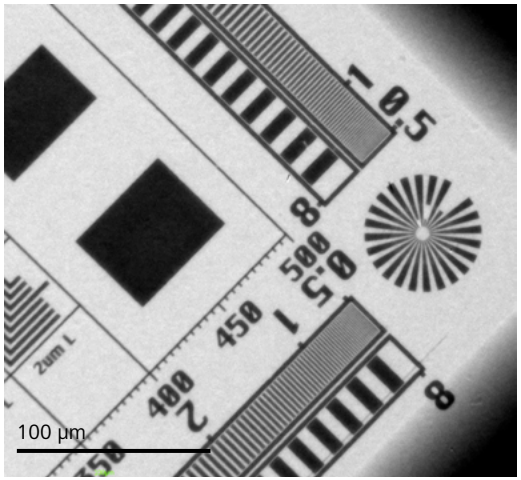
Your Insight into the Technology Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Achieve True Resolution

ZEISS Versa XRM solutions deliver powerful 3D X-ray imaging, maintaining true submicron spatial resolution across varying distances, sample sizes, and environments. ZEISS XRM are specified on true spatial resolution, the most meaningful measurement of your microscope's performance.

Spatial resolution refers to the minimum separation at which your imaging system can resolve a feature pair. You would typically measure it by imaging a standardized resolution target with progressively smaller line-space pairs. Spatial resolution accounts for critical characteristics such as X-ray source spot size, detector resolution, magnification geometry, and vibrational, electrical and thermal stability. Other terms such as "voxel," "spot size," "detail detectability," and "nominal resolution" do not convey your system's full performance.



	Resolution on Traditional microCT Systems	Higher Resolution on ZEISS 3D X-ray Microscope (XRM)
Spot size	Suffer from spot-size dependent blur.	Unique dual-stage magnification enables performance not limited by spot size
Sample size	Only able to achieve high resolution on smallest sample sizes.	ZEISS XRM RaaD technology enables highest resolution across diverse sample sizes and working distances.
Sample type	Limited to small, low-Z samples using low kV X-ray beam	Energy-tuned detectors enable highest resolution across broad ranges of sample types and densities
Instrument setup	Require installation of different source targets/ filaments for different operating needs	Source is designed to operate across the entire application space with a wide range of detectors, eliminating the need for manual hardware reconfigurations

Your Insight into the Technology Behind It

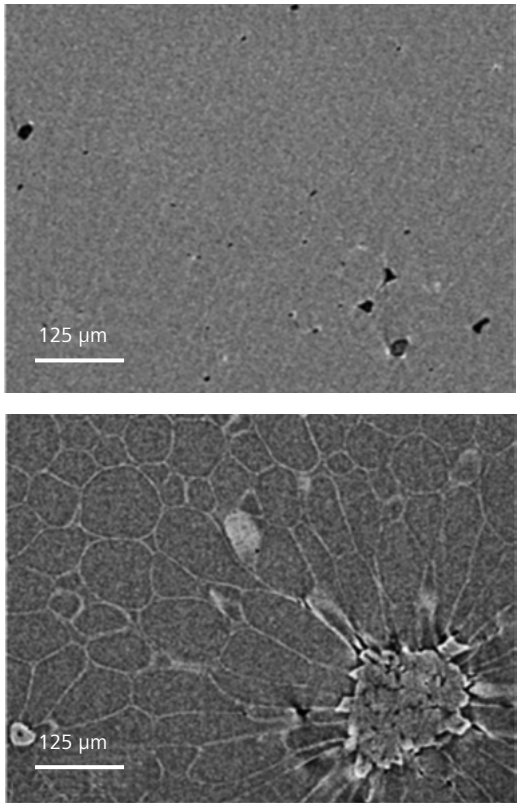
› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Gain an Edge in Contrast

Your imaging requires superior contrast capabilities to reveal details you need to visualize and quantify features. ZEISS Versa XRM deliver flexible, high contrast imaging for even your most challenging materials – low atomic number (low Z) materials, soft tissue, polymers, fossilized organisms encased in amber, and other materials of low contrast.

Our comprehensive approach employs proprietary enhanced absorption contrast detectors that provide you with superior contrast by maximizing collection of low energy photons while minimizing collection of contrast-reducing high energy photons.

In addition, tunable propagation phase contrast measures the refraction of X-ray photons at material transitions to allow you to visualize features displaying little or no contrast during absorption imaging.



Pear imaged with absorption contrast – no visibility of cell walls (top), and pear imaged with phase contrast, showing details of cell walls in normal cells and stone cells (bottom).

Your Insight into the Technology Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Use Our Super Simple User Interface to Create Efficient Workflows

All of the features introduced by the ZEISS Xradia 515 Versa are seamlessly integrated within the Scout-and-Scan Control System, an efficient workflow environment that allows you to easily scout a region of interest and specify scanning parameters. The easy-to-use system is ideal for a central lab-type setting where your users may have a wide variety of experience levels.

The interface maintains the flexibility for which ZEISS Versa XRM systems are known, enabling you to set-up scans even more easily. Scout-and-Scan software also offers recipe-based repeatability, which is especially useful for your *in situ* and 4D research, and enables you to have greater control and efficiency for future work.

Set, Load, Scout, Scan, Run. It's that simple.

Scout-and-Scan Advantages

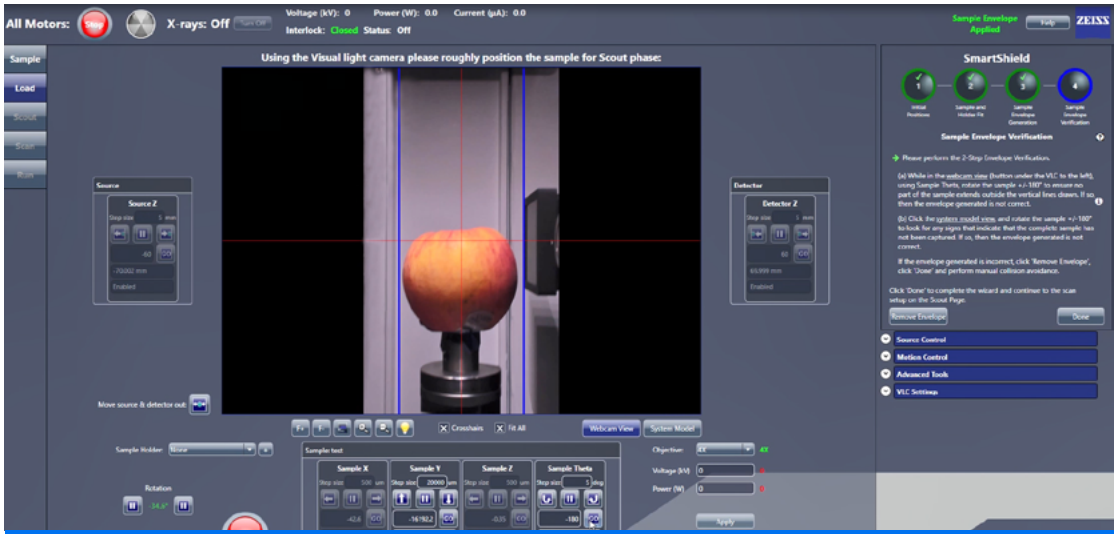
- Internal camera for sample viewing
- Recipe control (set, save, recall)
- Multiple energies
- Multiple samples with Autoloader option
- Micropositioning capability with a simple mouse click

Your Insight into the Technology Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

SmartShield – Protect Your Sample and Optimize Experiment Set-up

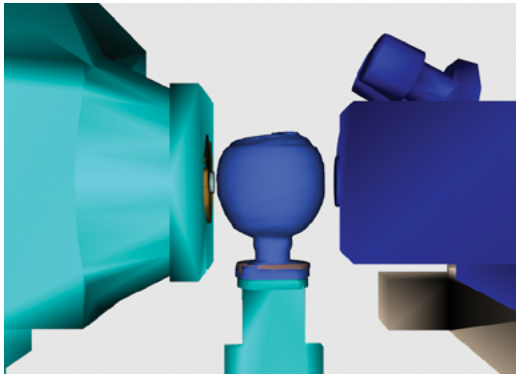
ZEISS SmartShield is a simple solution that protects your sample and your microscope, working within the ZEISS Scout-and-Scan control system. ZEISS SmartShield wraps a digital "envelope" around your sample with an easy click of a button. This automated solution allows you to confidently bring your sample even closer to the source and detector. With ZEISS SmartShield, new and advanced users alike can experience an elegant sample set-up workflow and efficient navigation of the ZEISS Versa XRM system.



Watch this video and gain insights into the workflow guided by SmartShield.

What SmartShield Offers:

- Fully integrated rapid envelope creation within Scout-and-Scan
- 3D awareness for sample and instrument safety
- Enhanced operator efficiency during setup



Digital envelope of the sample created by ZEISS SmartShield

Expand Your Possibilities

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

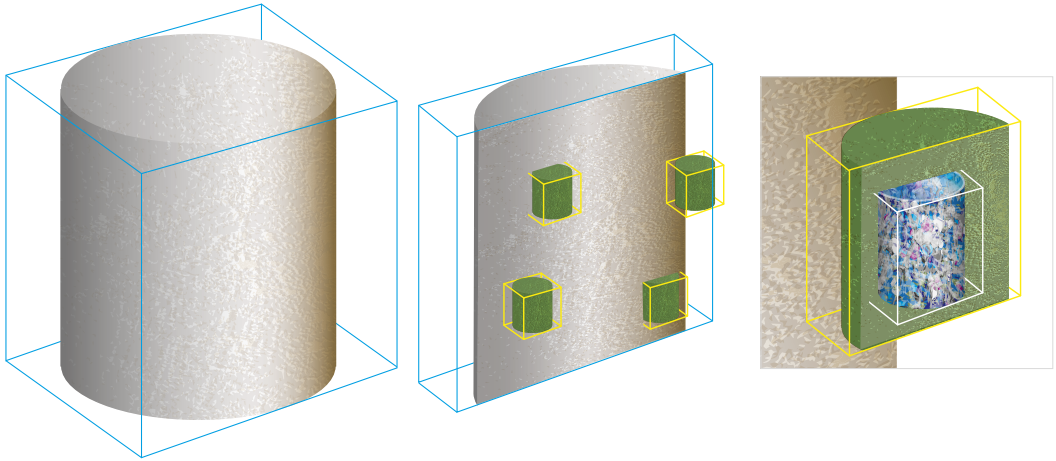
Image Even Larger Samples with High Throughput

The optional ZEISS Versa Flat Panel Extension (FPX) delivers large-sample, high throughput scanning with ZEISS best-in-class image quality. FPX enhances imaging flexibility and creates workflow efficiencies with an all-in-one system for industrial and academic research.

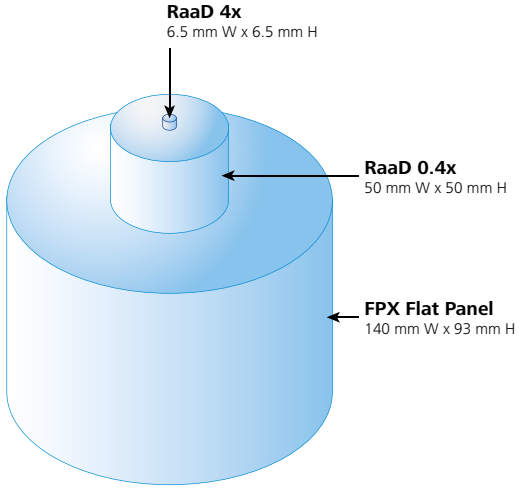
Scout-and-Zoom is a unique capability of ZEISS Versa XRM that leverages FPX to perform a low resolution, large field of view, scout scan and identify interior regions for higher resolution zoom scans on a variety of different sample types.

This powerful technique is achieved only by the Versa dual magnification microscope objectives that enable RaaD and can be used to accurately identify regions of interest in several applications such as imaging a specific region of trabecular bone inside an intact bone, a particular solder bump in the interior of large semiconductor package, or a specific area of cracks or voids in a composite sample.

Now, advanced reconstruction technologies, such as DeepRecon Pro, can improve the image quality of challenging zoom scans without increasing image acquisition time, while DeepScout improves the scout scan, providing resolution at FOV.



Scout-and-Zoom large sample at high throughput with high resolution sub-sampling



Comparison of reconstructions of single FOV volumes performed with different objectives.

FPX Specifications

Flat Panel Detector Array	3072 px × 1944 px
Single FOV	140 mm diameter
	93 mm height
Maximum field of view with automated stitching	140 mm diameter
	165 mm height

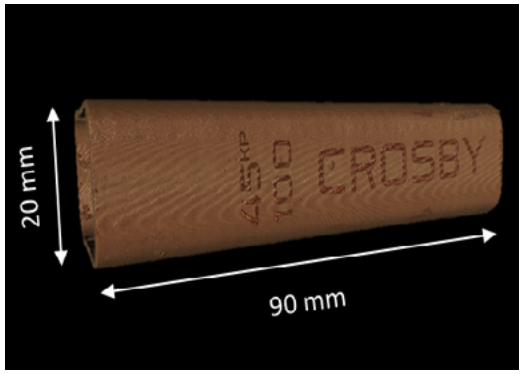
Expand Your Possibilities

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Large Object Scout-and-Zoom Workflows with FPX

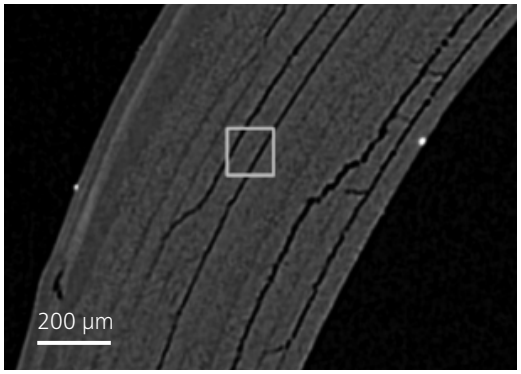
Three-stage Scout-and-Zoom workflow. Rapidly scan large field of view with FPX and then zoom to regions of interest with RaaD objectives.

FPX

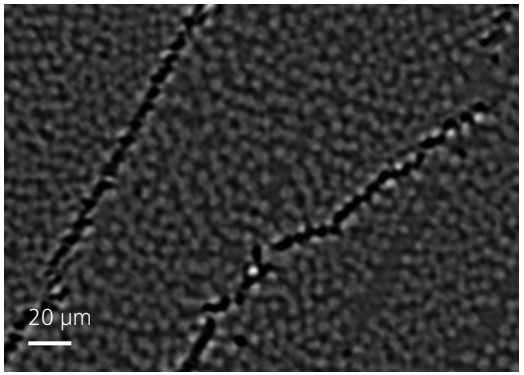


Sample set: hockey stick fiber-reinforced composite

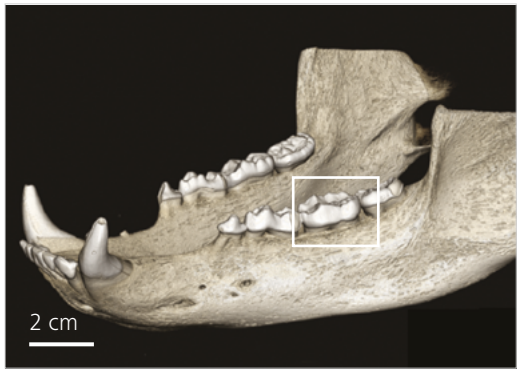
0.4×



4×

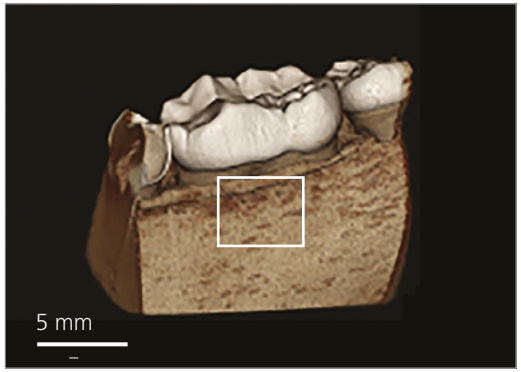


FPX

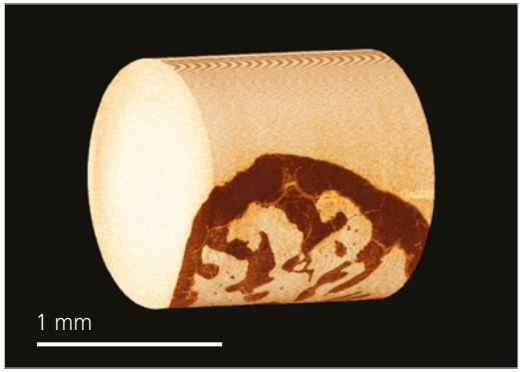


Sample set: bear jaw, 15 cm long

0.4×



4×



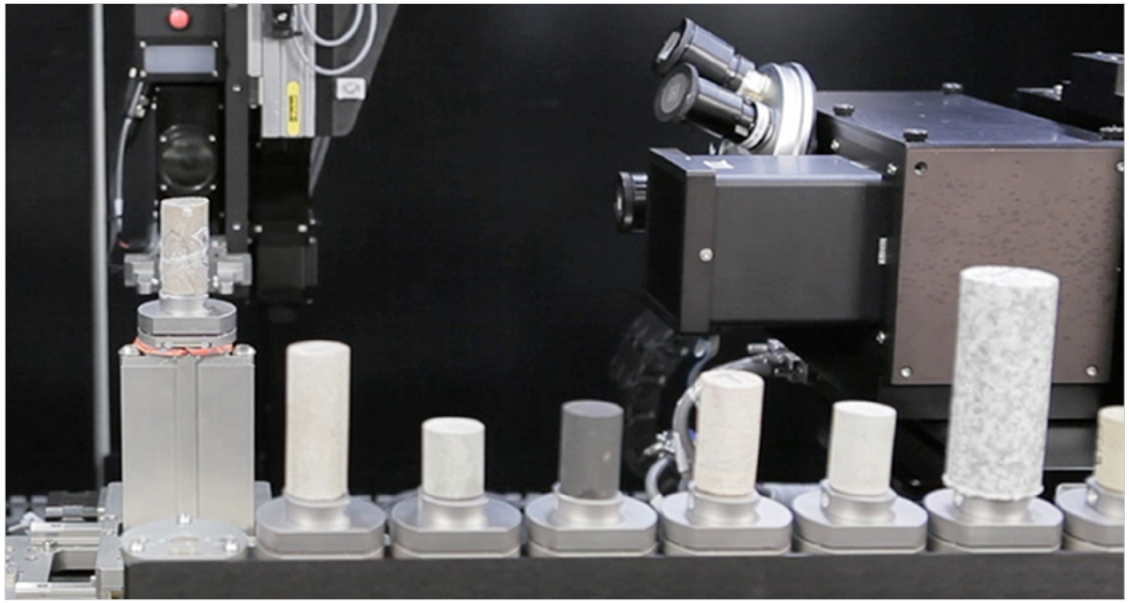
Expand Your Possibilities

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Autoloader to Increase Your Sample Handling Efficiency

Maximize your instrument's utilization by minimizing user intervention with the optional robotic ZEISS Autoloader, available for all instruments in the ZEISS Versa XRM series of submicron 3D X-ray microscopes. Reduce the frequency of user interaction and increase productivity by enabling multiple jobs to run. Load up to 14 sample stations, which can support up to 70 samples, queue, and allow to run all day, or off-shift.

The software provides you with the flexibility to re-order, cancel, or stop the queue to insert a high priority sample at any time. An e-mail/text notification feature in the Scout-and-Scan user interface provides timely updates on queue progress. Autoloader also enables a workflow solution for high volume repetitive scanning of like samples.



Autoloader option enables you to program up to 14 samples at a time to run sequentially.

Expand Your Possibilities

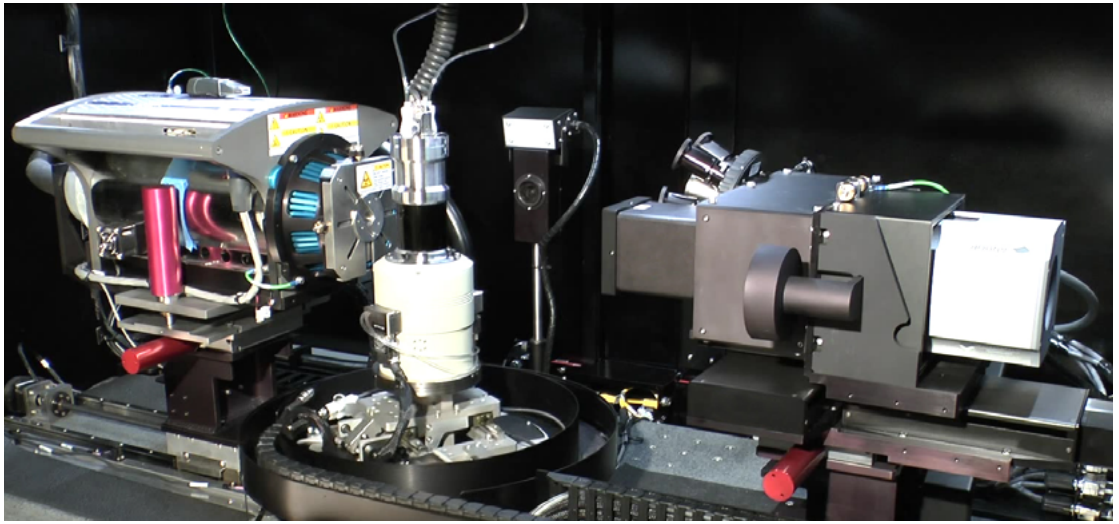
› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Enhance Your Experimental Possibilities by Adding the ZEISS *In Situ* Interface Kit to Your XRM

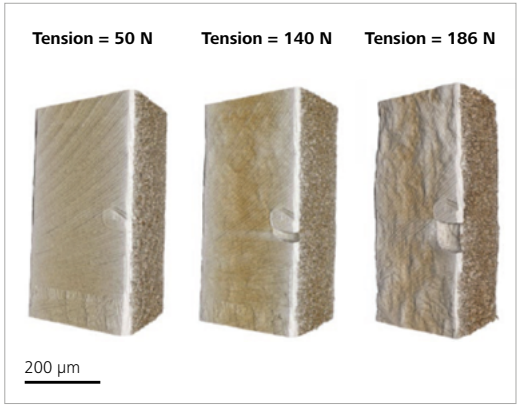
Continuing to push the limits for scientific advancement, ZEISS Versa XRM solutions have evolved to provide you with the industry's premier 3D imaging solution for the widest variety of *in situ* rigs, from high pressure flow cells to tension, compression, and thermal stages.

ZEISS XRM uniquely enable the most advanced *in situ* experiments. These studies require samples to be further away from the X-ray source to accommodate various types of *in situ* rigs. On traditional microCT systems, this significantly limits the resolution achievable for your samples. ZEISS XRM are uniquely equipped with dual-stage magnification architecture with RaaD technology that enables the highest resolution for *in situ* imaging.

You can add the optional *In Situ* Interface Kit to all ZEISS Versa XRM instruments. Contents include a mechanical integration kit, a robust cabling guide and other facilities (feed-throughs) along with recipe-based software that simplifies your operation from within the ZEISS Scout-and-Scan user interface. Experience the highest level of stability, flexibility, and controlled integration of such *in situ* devices on ZEISS Versa XRM, which benefit from an optical architecture that doesn't compromise resolution in variable environmental conditions.



Making the industry's best in situ *solution even better:* in situ *kit tracking with Deben thermomechanical stage*



Tensile testing of a steel laser weld under increasing load. The data reveal a crack initiating and propagating from a rough surface imperfection, as well as the elongation of internal voids. Sample courtesy of Sandia National Laboratories.

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

ZEISS Advanced Reconstruction Toolbox

ZEISS Advanced Reconstruction Toolbox (ART) is an innovative platform through which you can continuously access state-of-the-art reconstruction technologies from ZEISS to enrich your research and increase the return on investment of your 3D XRM.

These unique offerings leverage AI and a deep understanding at ZEISS of both X-ray physics and customer applications to solve some of the hardest imaging challenges in new and innovative ways. These optional modules are workstation-based solutions that provide easy access and usability.

ZEISS DeepRecon Pro

DeepRecon Pro is an innovative AI-based technology bringing superior throughput and image quality benefits across a wide range of applications. DeepRecon Pro is applicable to both unique samples as well as semi-repetitive and repetitive workflows. Customers can now self-train new machine learning network models on-site with an extremely easy-to-use interface.
The one-click workflow of DeepRecon Pro eliminates the need for a machine learning expert and can be seamlessly operated by even a novice user.

ZEISS DeepScout

ZEISS DeepScout uses high-resolution 3D X-ray microscopy datasets as training data for lower resolution, larger field of view datasets and upscales thelarger volume data using a neural network model.DeepScout, developed through continue algorithmic innovation enabled by the unique AI infrastructure from ZEISS, employs the unique Scout-and-Zoom capability to acquire richer information at higher resolution, including interior tomographies for large samples.
Now you can take your large overview scan, feed it through the DeepScout reconstruction algorithm, and get resolution that approaches the resolution of a zoom scan, but over a much larger field of view. At its core, DeepScout relies on the ability to generate multiscale, spatially registered datasets and uses that ability to train neural networks to improve the reconstruction.

New capabilities, fueled by deep learning, mitigate the traditional trade-off between field of view and resolution.

ZEISS DeepRecon Pro and ZEISS DeepScout are offered as part of the AI Supercharger package for the Advanced Reconstruction Toolbox.

	FDK Standard Analytical Reconstruction	**OptiRecon** Iterative Reconstruction	**DeepRecon Pro** AI (Deep-Learning) based Reconstruction	**DeepScout**
Throughput	1×	up to 4×	up to 10×	up to 100×
Image Quality*	Standard	Better	Best	Unprecedented over LVOV, FVOV**
Ease-of-use	Minimal	Requires parameter optimization	One-click setup	Simple setup Scout-and-Zoom

* Image quality refers to the contrast-to-noise ratio and the relative performance of reconstruction technologies is shown.
** Large volume of view and full volume of view.

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

ZEISS PhaseEvolve
ZEISS PhaseEvolve is a patented* post-processing reconstruction algorithm that enhances the image contrast by revealing material contrast uniquely inherent to X-ray microscopy, which can often be obscured by phase effects in low-medium density samples or high-resolution datasets. Perform more accurate quantitative analysis with improved contrast and segmentation of your results.

ZEISS Materials Aware Reconstruction Solution (MARS)
ZEISS MARS is a reconstruction algorithm that is aware of the constituents within a reconstruction. A challenge in X-ray reconstruction in a lab setting is that imaging with a polychromatic source creates different X-ray energies to generate a phenomenon called beam hardening. This effect is particularly challenging when your material is very dense and embedded in a relatively less dense material. MARS tells the reconstruction system how to compensate for the effect of extreme beam hardening in the regions between very dense objects.

This is important in applications like biomaterials, where you might be looking at implants next to bone or tissue. Or electronics where extremely dense solder balls appear next to other less dense materials on a printed circuit board, generating strong artifacts. MARS reconstructs your images to compensate for these effects.

ZEISS PhaseEvolve and MARS form the Artifact Reduction package of ART.

ZEISS OptiRecon
ZEISS OptiRecon is a fast and efficient algorithm-based technology that delivers iterative reconstruction from your desktop, allowing you to achieve up to 4× faster scan times or enhanced image quality with equivalent throughput.

OptiRecon is an economical solution offering superior interior tomography or throughput on a broad class of samples.

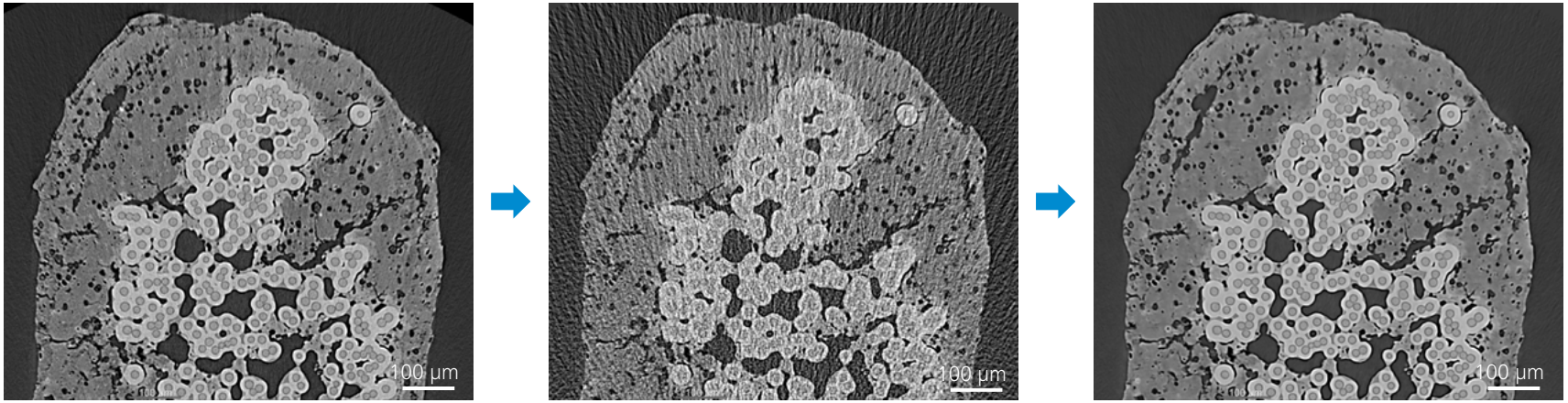
ZEISS OptiRecon bonds with ZEISS DeepRecon to create the Recon package of ART.

**US Patent 11645792B2*

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

ZEISS DeepRecon Pro – How It Works in Materials Science



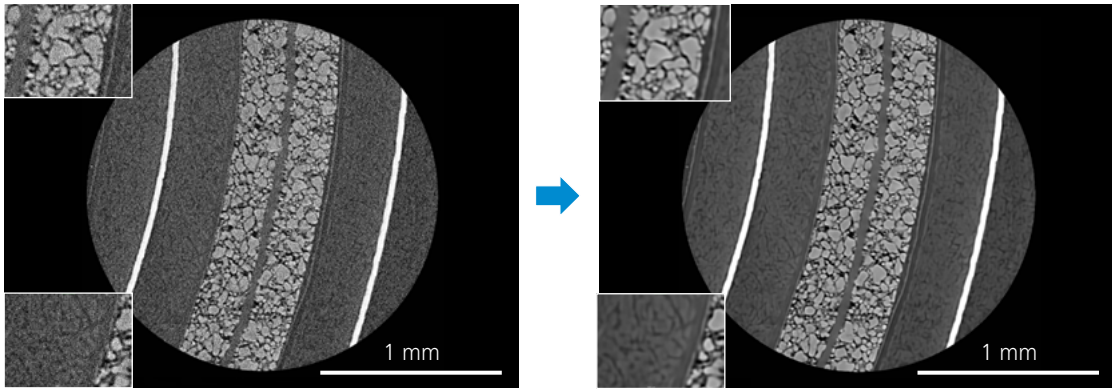
Standard reconstruction (FDK): Scan time 9 hrs (3001 projections)

Standard reconstruction (FDK): Scan time 53 mins (301 projections)

DeepRecon Pro: Scan time 53 mins (301 projections)

DeepRecon Pro used for throughput improvement for Ceramic Matrix Composite (CMC) sample, achieving 10× throughput improvement without sacrificing image quality. This would allow for much higher temporal resolution for in situ *studies.*

ZEISS DeepRecon Pro – How It Works in Electronics



Standard Reconstruction (FDK)

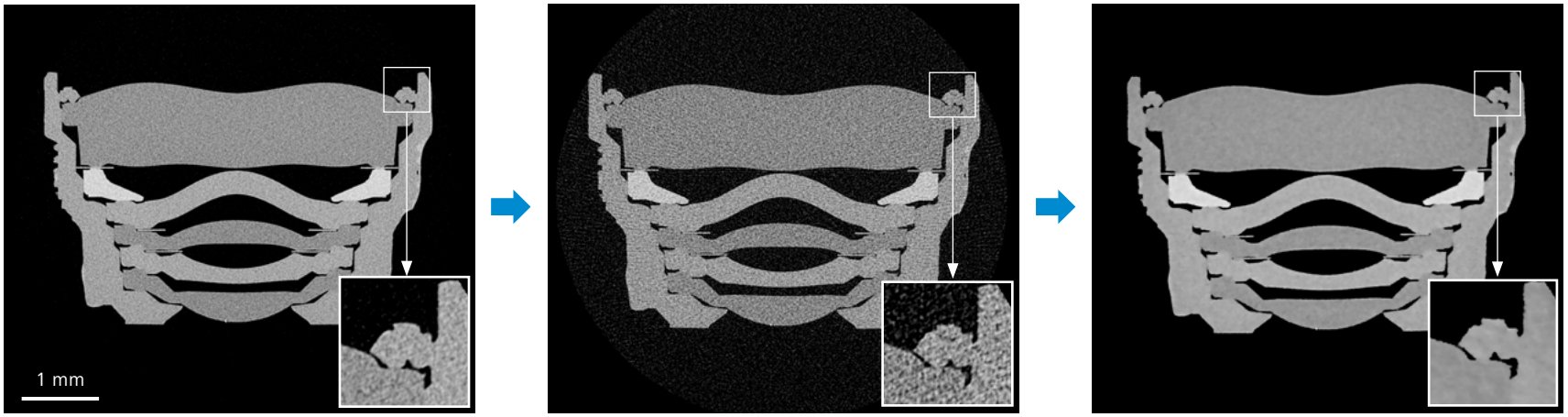
DeepRecon Pro

DeepRecon Pro used for image quality improvement for a smartwatch battery. DeepRecon Pro both improves the clarity of cathode grains and polymer separator. It also allows for the recovery of features otherwise obscured by image noise, such as the electrolyte saturated anode.

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

ZEISS OptiRecon – How It Works in Electronics



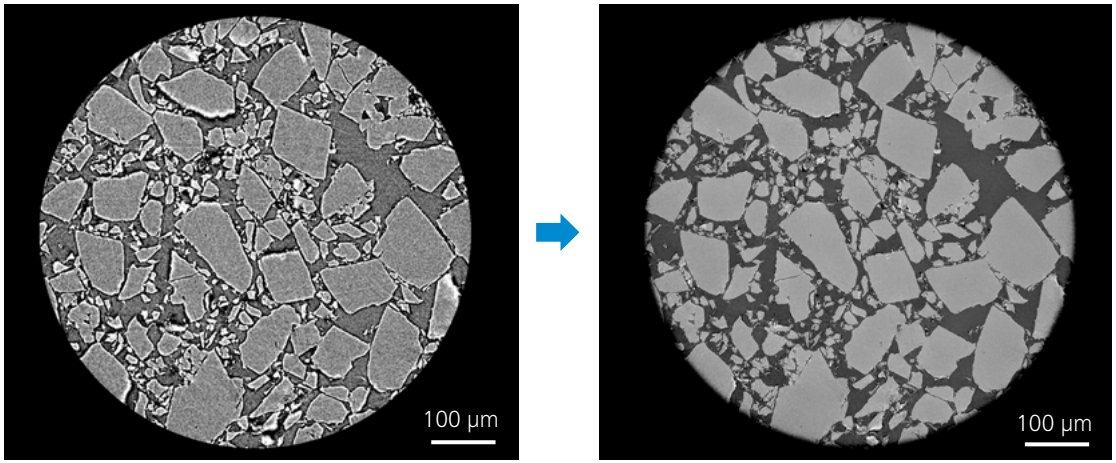
Standard reconstruction: Scan time 90 minutes (1200 projections)

Standard reconstruction: Scan time 22 minutes (300 projections)

OptiRecon: Scan time 22 minutes (300 projections)

Observe the performance of OptiRecon in a workflow performed on an electronics sample. Analyze integration issues in a smart phone camera lens, now 4× faster using OptiRecon.

ZEISS PhaseEvolve – How It Works in Materials Science



Standard reconstruction

PhaseEvolve applied reconstruction

Application of PhaseEvolve to a pharmaceutical powder sample. High resolution or low kV imaging can result in inherent material contrast being obscured by phase contrast artifacts. PhaseEvolve effectively removes phase fringes to enhance image contrast and improve segmen-tation results.

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Python API for Your Custom Use Case

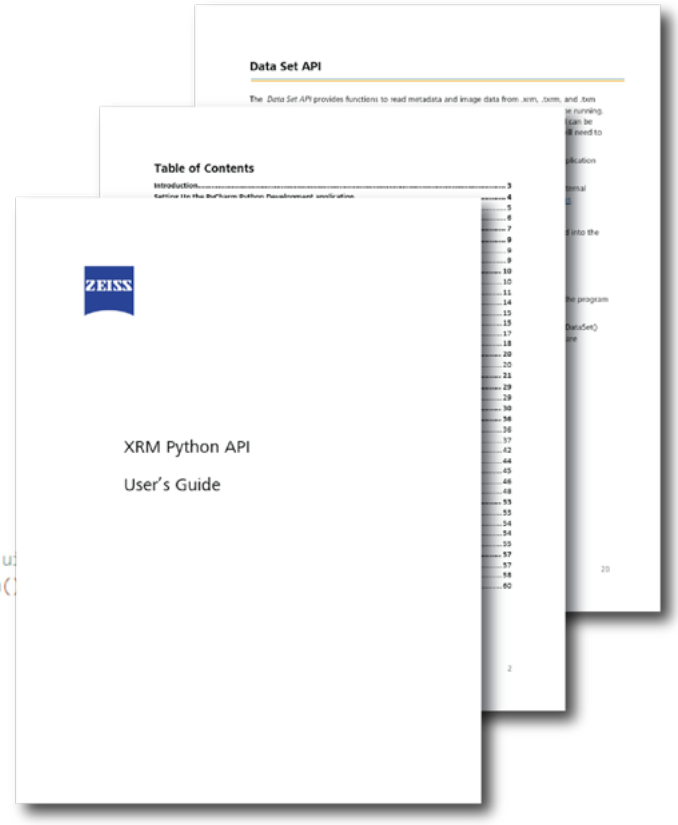
The ZEISS XRM Python API provides additional capability to interact with Versa X-ray microscopes. There are three different ZEISS XRM APIs that can be used in Python scripts for various use cases.

- The Basic API module provides methods to interact with the microscope, such as moving motors and changing objectives.
- The Recipe API module contains functions that can modify and run recipes to acquire data.
- The Basic Data Set API module can be used to read the data generated by an acquisition or reconstruction.

With the seamless integration of Python API into the control system, you can expand instrument control capabilities and enhance the productivity and quality of your research.

main_txm.py

```python
from XradiaPy import Data
import numpy as np
from PIL import Image
import os
import json
import csv

save_dir = '.\Images_txm'
data_dir = r"\\foo\\bar\\dir"
group_name_id = 6
tomo_name_id = 7


def choose_image(myDataset):

    num_slices = myDataset.GetProjections()

    data = np.array(myDataset.GetImageData(num_slices // 2), dtype=np.u
    data = np.reshape(data, (myDataset.GetHeight(), myDataset.GetWidth(
    data = np.uint8(data / 256)

    im = Image.fromarray(data)
    #im.show()

    return im


```

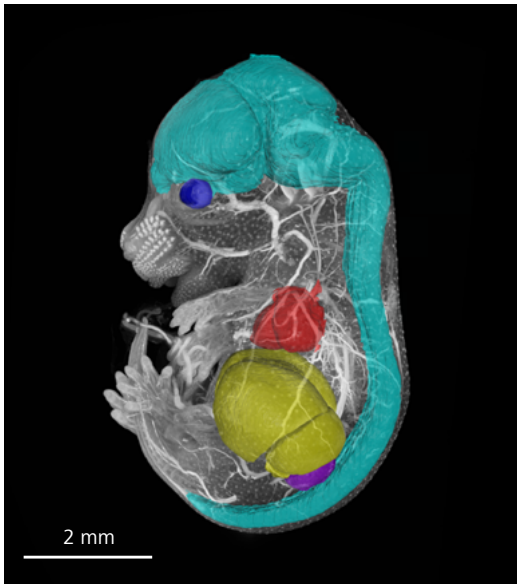


Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

Flexible, End-to-End Image Analysis Pipelines

ZEISS arivis Pro empowers you to automate image analysis and visualization pipelines. Leverage traditional methods or AI models effortlessly to create pipelines for any image size, dimension, or modality without the need to code.



Segmentation and visualization of a complete mouse embryo volume performed with ZEISS arivis software. Sample courtesy of Chih-Wei Logan Hsu, Baylor College of Medicine

The software supports and handles more than 30 commercial file formats. Efficiently process large files with ease. Pre-configured pipelines and standard assays are available for both simple and demanding analysis tasks. Or you can customize pipelines for your specific goals.

It takes just one click to repeat your analysis for consistent, quantitative results. Boost productivity and ensure reproducible results.

ZEN AI Toolkit including Intellesis

Machine learning can exponentially increase the throughput of image analysis and reduce the risk of human error. This toolkit contains solutions for image denoising, image segmentation, and object classification.

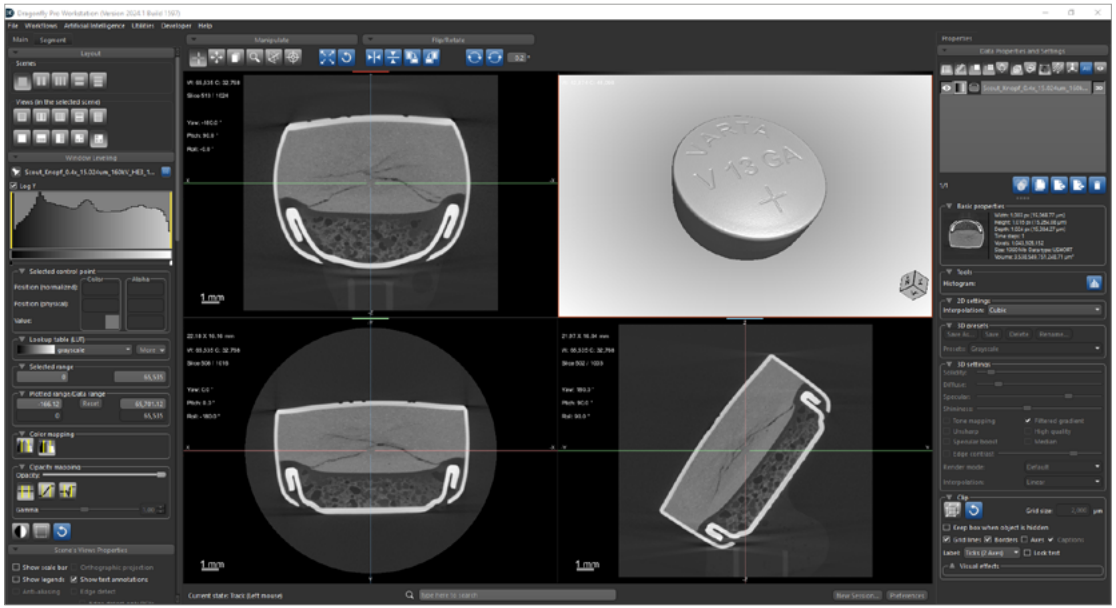
- Improve every step of the image analysis workflow
- Enable even new users to quickly gain proficiency
- Import third-party machine learning models

Your Insight into the Software Behind It

› In Brief
› **The Advantages**
› The Applications
› The System
› Technology and Details
› Service

3D World ZEISS Edition – Your Visual Pathway to Quantitative Answers

3D World ZEISS edition from Dragonfly is advanced 3D visualization and analysis software. It is offered exclusively by ZEISS for processing XRM, SEM, and FIB-SEM data. Combining advanced image processing algorithms and state-of-the-art volume rendering, 3D World enables high definition exploration and powerful quantitative analysis of your data. 3D World is distinguished by its ease of use, best-in-class image segmentation toolkit, and endless extensibility. Import your multi-scale, multi-microscope image studies, and you'll discover that 3D World is the most advanced correlative imaging platform available. Integrated with a suite of image processing tools for 2D and 3D image registration, resampling, and more, 3D World's cutting-edge image filters will make imaging artifacts disappear.



Tailor tools that are optimal to your workflow: choose plug-ins that allow you to control registration, map differences, and customize appearance. Commercial button cell battery, imaged on a ZEISS VersaXRM microscope.

Your visual results will let your images speak for themselves. Capture and share insightful screenshots—as still images or 2D animations—or turn to 3D World's 3D Movie Maker for effortless high-impact 3D animations.

3D World's integrated machine learning engine solves segmentation of even the most challenging samples, while interactive painting and contouring tools make curation and fine edits a breeze. Record your workflows and replay them as needed or in batch. Even write custom Python code to drive the software to highly-customized and robust solutions.

Simple to use, but delivering the quantitative answers and visual impressions you demand, 3D World will accelerate your 2D/3D data productivity.

Key User Benefits

- Ease of use
- Image segmentation
- Multi-modal (XRM, SEM, FIB-SEM)
- Scripting robust and batching workflows
- Multi-scale
- Quantitative analysis
- Movies

Precisely Tailored to Your Applications

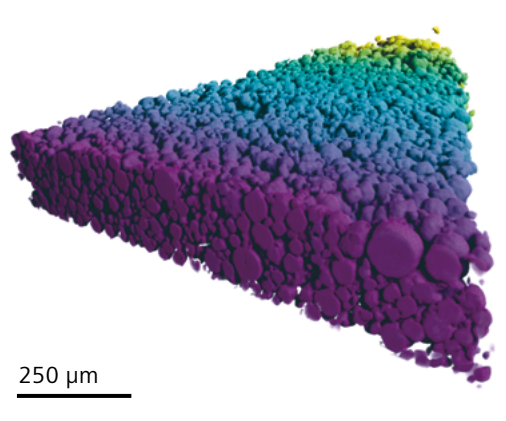
› In Brief
› The Advantages
› **The Applications**
› The System
› Technology and Details
› Service

	Task	ZEISS Xradia 515 Versa Benefits
Materials Research	Expand your materials research capabilities from visualizing cracks in soft composite materials to measuring porosity in steel, all with a single system. Perform *in situ* studies by imaging under varying conditions such as tensile, compression, dessication, wetting and temperature variations.	View into deeply buried microstructures that may be unobservable with 2D surface imaging such as optical microscopy, SEM, and AFM. You have the ability to maintain RaaD for *in situ* imaging experiments, allowing you to study a wide variety of sample sizes and shapes using various *in situ* apparatus. With the nondestructive nature of X-ray, you can additionally understand the impact of these varying conditions over time.
Life Sciences	Quantify osteocyte properties for bone morphology, map neural networks, study vasculature, and understand development of bio structures.	Leverage the highest resolution and highest contrast for exploring unstained and stained hard and soft tissues.
Raw Materials	Characterize and quantify pore structure, analyze mineral liberation efforts, study carbon sequestration effectiveness.	Achieve accurate 3D submicron characterization of rock pore structures for digital rock simulations and perform *in situ* multiphase fluid flow studies. Analyze particles with full 3D reconstruction.
Semiconductor and Electronics	Optimize your processes and analyze failures.	Use non-destructive submicron imaging of intact packages for defect localization and characterization, complementing or replacing physical cross-sectioning.
Battery and Energy Storage	Analyze failures and perform quality inspections of separator and electrodes for defects and inclusions; track aging mechanisms.	Use non-destructive 4D *in situ* imaging of intact energy materials without destroying the functionality of the device or disturbing the intricate internal structures.
Manufacturing Technology	Analyze internal tomographies of 3D printed parts.	Use Scout-and-Zoom to identify a specific region of interest for investigation, and high resolution imaging to see fine details such as un-melted particles, high-Z inclusions, and small voids, without any sample manipulation.

ZEISS Xradia 515 Versa at Work

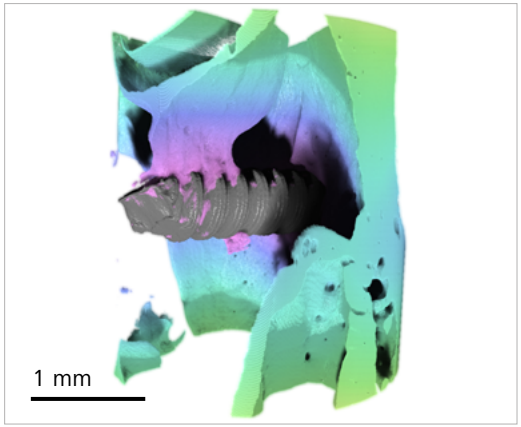
› In Brief
› The Advantages
› **The Applications**
› The System
› Technology and Details
› Service

Materials Research



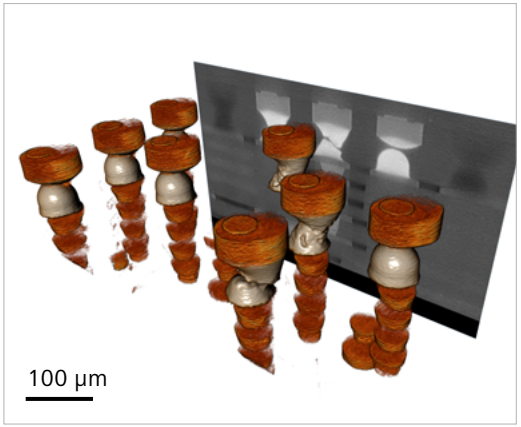
Lithium ion battery cathode electrode

Life Sciences



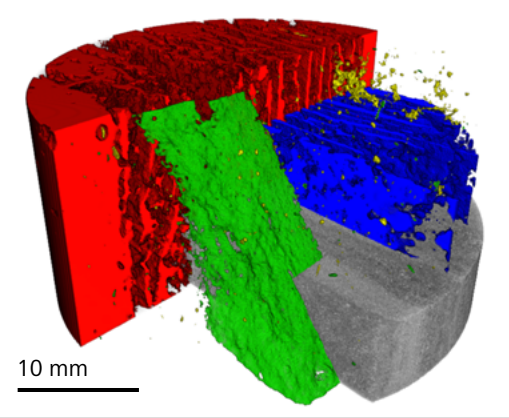
Dental implant showing attachment points and new growth

Semiconductor



Non-destructively image flip chip bump defects

Raw Materials



Classification of shale heterogeneity

Electronics

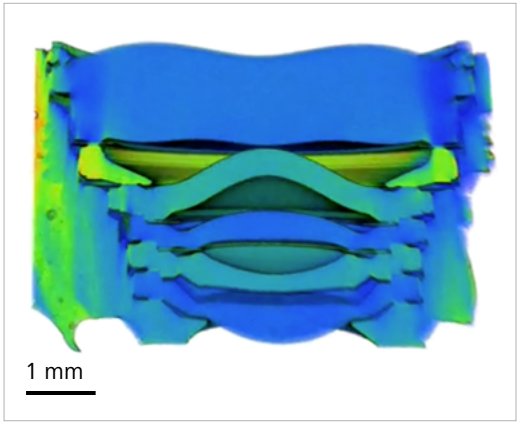


Image intact devices such as the mobile phone camera above to see inside without destroying your sample.

Your Flexible Choice of Components

1 X-ray Microscope
- ZEISS Xradia 515 Versa with Resolution at a Distance (RaaD)

2 X-ray Source
- High performance, sealed transmission source (30 – 160 kV, Maximum 10 W)

3 Contrast-optimized Detectors
- Innovative dual-stage detector system with detector turret of multiple objectives at different magnifications with optimized scintillators for highest contrast
- Optional 40× objective
- 2k × 2k pixel, noise suppressed charge-coupled detector
- 3k × 2k pixel, large FOV FPX detector (optional)

4 System Stability for Highest Resolution
- Granite base vibrational isolation
- Thermal environment stabilization
- Low noise detector
- Advanced proprietary stabilization mechanism

5 System Flexibility for Diverse Range of Sample Sizes
- Variable scanning geometry
- Tunable voxel sizes
- Absorption contrast mode
- Phase contrast mode
- Vertical stitching for joining multiple tomographies vertically

6 Smartshield for Sample Protection and Setup Optimization
- Fully integrated rapid envelope creation within Scout-and-Scan control system
- Sample and instrument safety in 3D
- Enhanced operator efficiency during experiment setup

7 Autoloader Option
- Maximize productivity by reducing user intervention
- Programmable handling of up to 14 samples
- Automated workflows for high volume, repetitive scanning

8 Sample Stage
- Ultra-high precision 4-degrees of freedom sample stage
- 25 kg sample mass capacity

9 X-ray Filters
- Single filter holder with a set of 12 filters
- Custom filters available by special order

10 *In Situ* and 4D Solutions
- Resolution at a Distance enables superior *in situ* imaging
- Integrated *in situ* recipe control for Deben stages
- *In situ* interface kit option
- Custom *in situ* flow interface kit by special order

11 Instrument Workstation
- Power workstation with fast reconstruction
- Single CUDA-based GPU
- Multi-core CPU
- 27" 4K display monitor

12 Advanced Reconstruction Toolbox with Options for Enhanced Performance
- ZEISS DeepRecon Pro with AI-based reconstruction technology for up to 10× throughput or superior image quality on unique, semi-repetitive, and repetitive sample workflows.
- ZEISS DeepScout for resolution and throughput at full field of view for r econstruction that is 100x faster
- ZEISS OptiRecon with iterative reconstruction for up to 4× throughput or enhanced image quality
- ZEISS Material-Aware Reconstruction Solution (MARS) for highly attenuating samples, reducing the effects of beam hardening
- ZEISS PhaseEvolve for enhanced contrast and segmentation in low-medium density sample or high-resolution imaging applications

13 Software
- Acquisition: Scout-and-Scan Control System with SmartShield
- Reconstruction: Scout-and-Scan Reconstructor
- Viewer: TXM 3D Viewer
- XRM Python API to expand instrument capabilities
- Optional ZEN AI Toolkit with Intellesis for image post-processing and segmentation using machine learning
- Optional ZEISS arivis Pro for automated image analysis
- Compatible with wide breadth of 3D viewers and analysis software programs
- 3D World ZEISS edition visualization and analysis (optional)

Technical Specifications

Imaging	ZEISS VersaXRM 730	ZEISS VersaXRM 615	ZEISS Xradia 515 Versa
Spatial Resolution[a]	450 nm	500 nm	500 nm
Resolution Performance[b] (ZEISS Resolution Target at 160 kV/LE6, equivalent to 1.3 mm Al and 40x-P objective)	500 nm		
Resolution at a Distance (RaaD)[c] (50 mm working distance)		1.0 µm	1.0 µm
Resolution Performance at a Distance (ZEISS Resolution Target at 140 kV/LE4, equivalent to 0.6 mm Al)	700 nm @ 50 mm 750 nm @ 100 mm		
Minimum Achievable Voxel[d] (Voxel size at sample at maximum magnification)	40 nm	40 nm	40 nm

X-ray Source

Architecture	Sealed transmission, fast activation	Sealed transmission, fast activation	Sealed transmission, fast activation
Voltage Range	Spot size stable 30 - 160 kV	Spot size stable 30 - 160 kV	Spot size stable 30 - 160 kV
Maximum Output	25 W	25 W	10 W

Contrast-Optimized Detector System

ZEISS X-ray microscopes (XRM) feature an innovative detector turret with multiple objectives at different magnifications. Each objective features optimized scintillators that deliver the highest absorption contrast details.

	Standard			Optional		Standard			Optional		Standard			Optional	
Objectives & Detectors	0.4×	4×	20×	FPX	40×-P	0.4×	4×	20×	FPX	40×	0.4×	4×	20×	FPX	40×
Spatial Resolution	20 µm	1.9 µm	0.9 µm	12 µm	0.45 µm	20 µm	1.9 µm	0.9 µm	12 µm	0.5 µm	20 µm	1.9 µm	0.9 µm	12 µm	0.5 µm
Max 3D Field of View (FOV)	50 mm	6.5 mm	1.3 mm	140 mm	645 µm	50 mm	6.5 mm	1.3 mm	140 mm	645 µm	50 mm	6.5 mm	1.3 mm	140 mm	645 µm
Wide Field Mode, Max 3D FOV		11 mm													

Stages

Sample stage, load capacity	25 kg
Sample stage travel, X,Y,Z	50 mm, 100 mm, 50 mm
Sample stage travel, rotation	360°
Source travel, Z direction[e]	190 mm
Detector travel, Z direction (objectives)	290 mm
Detector travel, Z direction (FPX detector)	250 mm

a) Spatial resolution measured with ZEISS XRM 2D resolution target, normal field mode, optional 40×-P (730) or 40x (615, 515)
b) Resolution performance measured with ZEISS XRM 2D resolution target, normal field mode, optional 40×-P objective
c) RaaD working distance is defined as clearance around axis of rotation (sample radius). Resolution is measured with ZEISS 2D resolution target
d) Voxel is a geometric term that contributes to but does not determine resolution and is provided here only for comparison. ZEISS specifies resolution via spatial resolution for Versa XRM, the true overall measurement of instrument resolution
e) Z-direction is defined along the X-ray beam path

Technical Specifications

Features	ZEISS VersaXRM 730	ZEISS VersaXRM 615	ZEISS Xradia 515 Versa
ZEN navx User Experience w/File Transfer Utility	■	■	
Scout-and-Scan Control System			■
Scout-and-Zoom	Volume Scout in ZEN navx	Volume Scout in ZEN navx	Manual or with 3D World ZEISS edition
Vertical Stitch	■	■	■
Source Filters	Automated Filter Changer (AFC) 24-filter capacity, 12 standard filters included	Single manual filter holder, 12 standard filters included	
High Aspect Ratio Tomography (HART)	■		
Dual Scan Contrast Visualizer (DSCoVer)	■		
Flat Panel Extension (FPX)	Optional FPX; uses FAST or STEP Mode	Optional FPX; uses FAST or STEP Mode	Optional FPX with STEP Mode only
ZEISS LabDCT Pro for Diffraction Contrast Tomography	Optional		
Wide Field Mode	4×		
GPU CUDA-based Reconstruction	Dual	Dual	Dual
ZEISS SmartShield	SmartShield, SmartShield Lite	SmartShield, SmartShield Lite	SmartShield
ZEISS Autoloader	Optional	Optional	Optional
In Situ Interface Kit	Optional	Optional	Optional
Optional High Resolution Objectives	40x-P	40x	40x
Software			
Python API	■	■	■
ZEN AI Toolkit (incl. Intellesis)	Optional	Optional	Optional
ZEISS arivis Pro	Optional	Optional	Optional
3D World ZEISS Edition Powered by Dragonfly	Optional	Optional	Optional
Advanced Reconstruction Toolbox			
Secondary High Performance Workstation	■	■	Optional
DeepRecon Pro (2-year license)	■	■	Optional 1 year or perpetual license
ZEISS ART AI Supercharger (DeepRecon Pro + DeepScout)	Upgrade	Upgrade	Optional
ZEISS ART Recon Package (DeepRecon Pro + OptiRecon)	Upgrade	Upgrade	Optional
ZEISS ART Contrast Package (PhaseEvolve + MARS)	Optional	Optional	Optional
ZEISS ART Premium (all modules)[a]	Upgrade	Upgrade	Optional

a) All ART modules are also available individually.

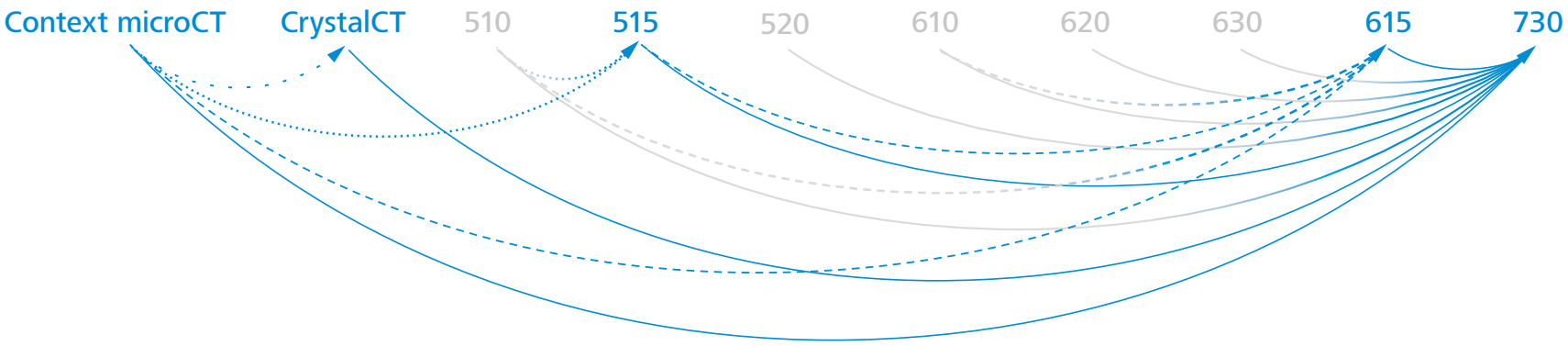
ZEISS Customer Focus: Continuous Improvement and Upgradeability

› In Brief
› The Advantages
› The Applications
› The System
› Technology and Details
› **Service**

Protect Your Investment extends to ZEISS VersaXRM 730 microscopes – delivering unprecedented extendibility and unrelenting support to ensure you are not left behind.

Most ZEISS X-ray microscopes are designed to be upgradeable and extendible with future innovations and developments so that your initial investment is protected. This ensures your microscope capabilities evolve with the advancements in leading technology and is one of the key differentiators in the 3D X-ray imaging industry.

To make certain your system offers the latest capabilities and remains serviceable, you can field-convert your platform to the latest X-ray technology: your ZEISS Context microCT can become a CrystalCT®, or higher performance Versa X-ray microscope. Your CrystalCT can become VersaXRM 730 with LabDCT. And every mid-tier Versa platform can be upgraded to the most advanced VersaXRM from ZEISS. In addition to instrument conversions at your facility, new modules are continuously developed that will enhance your instrument to provide advanced capabilities such as *in situ* sample environments, unique imaging modalities, and productivity-enhancing modules. Also, periodic major software releases include important new features that are made available to existing instruments, thereby enhancing and extending the capabilities of your research.



По вопросам продаж и поддержки обращайтесь:

Алматы (727)345-47-04
Ангарск (3955)60-70-56
Архангельск (8182)63-90-72
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Благовещенск (4162)22-76-07
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Владикавказ (8672)28-90-48
Владимир (4922)49-43-18
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Иркутск (395)279-98-46
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Коломна (4966)23-41-49
Кострома (4942)77-07-48
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Курган (3522)50-90-47
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Ноябрьск (3496)41-32-12
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Петрозаводск (8142)55-98-37
Псков (8112)59-10-37
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Саранск (8342)22-96-24
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Сыктывкар (8212)25-95-17
Тамбов (4752)50-40-97
Тверь (4822)63-31-35
Тольятти (8482)63-91-07
Томск (3822)98-41-53
Тула (4872)33-79-87
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Улан-Удэ (3012)59-97-51
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Чебоксары (8352)28-53-07
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Чита (3022)38-34-83
Якутск (4112)23-90-97
Ярославль (4852)69-52-93

Россия +7(495)268-04-70
Казахстан +7(727)345-47-04
Беларусь +(375)257-127-884
Узбекистан +998(71)205-18-59
Киргизия +996(312)96-26-47

эл.почта: zsf@nt-rt.ru || сайт: https://zeiss.nt-rt.ru/