ZEISS Xradia 610 Versa
Product Specifications

Imaging Specifications	
Spatial Resolution[a] (ZEISS Xradia Resolution Target)	0.5 μm
Resolution at a Distance (RaaD™)[a,b] (at 50 mm working distance)	1.0 μm
Minimum Achievable Voxel[c] (Voxel size at sample at maximum magnification)	40 nm

X-ray Source	
Architecture	Sealed Transmission, Fast Activation
Voltage Range	Spot size stable 30 – 160 kV
Maximum Output	25 W

X-ray Filters	
X-ray Filter Holder	Single filter capacity
X-ray Filters, Standard	Range of 12 filters
X-ray Filters, Custom	*Available by special order*

Contrast-Optimized Detectors					
	FPX Detector	0.4X Objective	4X Objective	20X Objective	40X Objective
	Optional	Standard	Standard	Standard	*Optional*
Spatial Resolution	12 μm	20 μm	1.9 μm	0.9 μm	0.5 μm
Max 3D Field of View (FOV)	140 mm	50 mm	6.5 mm	1.3 mm	645 μm
Wide Field Mode, Max 3D FOV		90 mm			

Stages[d]	
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	190 mm
Detector Travel, Z-Direction (*Objectives*)	290 mm
Detector Travel, Z-Direction (*FPX Detector*)	250 mm

Notes:

[a] Spatial resolution measured with ZEISS Xradia 2D resolution target, normal field mode, optional 40x objective.
[b] RaaD™ working distance defined as clearance around axis of rotation.
[c] Voxel is a geometric term that contributes to but does not determine resolution, and is provided here only for comparison. ZEISS Xradia 610 Versa specifies resolution via spatial resolution, the true overall measurement of instrument resolution.
[d] Z-direction is defined along the X-ray beam path.

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Advanced Capabilities	
WFM (Wide Field Mode – Wider lateral field of view)	Standard on 0.4X objective
Vertical Stitching (Effective taller field of view by joining tomographies)	Standard
Python API (Integrated Python interface for user-scripted, specialized workflows to maximize productivity)	Standard
In Situ Control (Integrated *in situ* recipe control for Deben stage)	Standard
In Situ Interface Kit (Cable management and radiation safe pass-through hardware)	*Optional*
ZEISS FPX Flat Panel Extension (6MP large array detector for macroscopic imaging)	*Optional*
ZEISS Autoloader (14-sample automatic sample handler)	*Optional*
ZEISS OptiRecon (Iterative reconstruction for optimized tomographic imaging)	*Optional*
ZEISS ZEN Intellesis (Intelligent machine learning algorithms for image post-processing and segmentation)	*Optional*
ORS Dragonfly Pro (Advanced 3D visualization and analysis software)	*Optional*

Reconstruction (GPU-Accelerated)	
RaaD Objective Imaging (0.4X, 4X, 20X, 40X) (972 slices from 2000 projections, 2k x 2k)	< 2.2 min
FPX Detector Imaging (2000 slices from 1301 projections, 3k x 2k)	< 10 min

Charge-Coupled Device Detector	
Charge-Coupled Device, Pixel Array	2,048 x 2,048
Charge-Coupled Device, Operating Temperature	< -50° C
Charge-Coupled Device, Bit Depth	16 bits

System Control	
Instrument Software	
System Control & Tomography Acquisition	Scout-and-Scan™
Reconstruction	XMReconstructor
3D Viewer	XM3DViewer
Workstation	
Operating System	Windows7 Pro
Central Processing Unit (CPU)	Dual Ten Core CPU
Graphics Processing Unit (GPU)	Dual CUDA-architecture GPU
Hard Disk Physical Capacity	12 TB (3 x 4 TB), RAID-5
Memory	32 GB, 128 GB (FPX Option)
Display Monitor	24-inch LCD

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X-ray Radiation Safety	
Safety Standards Compliance	SEMI S2-1016b SEMI S8-1116 & S8-0712 EN/UL/IEC 61010-1-2010 (3rd edition) EN ISO13849-1:2008 NF C74-100
Radiation Safety Measured 25 mm above surface of enclosure	< 1 μSv / hr

FPX Flat Panel Detector (optional module)	
CMOS, Pixel Array	3,072 x 1,944
CMOS, Operating Temperature	Ambient
CMOS, Bit Depth	14 bits
Single Field of View (diameter / height)	140 mm / 93 mm
Maximum Field of View[e] (diameter / height)	140 mm / 165 mm

[e] *Maximum Field of View uses the Vertical Stitching software feature to extend the total reconstructed volume.*

Autoloader (optional module)	
Station Positions	14
Maximum Sample Dimensions (diameter)	56 mm[f] (using standard sample holders)
Maximum Sample Dimensions (height)	70 mm
Sample Maximum Weight	1.5 kg

[f] *For samples greater than 56 mm and up to 100 mm diameter, adjacent sample stations must be unoccupied. For example, at maximum sample diameter of 100 mm, a maximum of seven station positions are usable.*

In Situ Interface Kit (optional module)	
Integrated sample stage cable management system	Standard
Radiation-safe cable pass-through	~80 mm curved port diameter
Adaptor plate for sample stage[g]	Standard

[g] *For* in situ *environment cells provided by Deben UK Ltd. Adapter plates for other types of* in situ *cells are available by special order.*

In Situ Environment Cells[h] (optional, Interface Kit required)	
Stage Type	Tensile/Compression Tensile/Compression + Heat Tensile/Compression + Heat/Cool
Maximum Load	Up to 0.1/0.2/0.5/5 kN
Load Rate	0.03-2 mm/min
Load Accuracy	1% of full range scale
Maximum Extension	10 mm

[h] *In situ* environment cells provided by Deben UK Ltd. The above table represents range of the portfolio specifications. Individual cells have specific range attributes. Other brands and types of *in situ* cells with different capabilities are available upon request.