Product Overview

xradia®

UltraXRM-L200

Nano-scale X-ray Microscope

Synchrotron-quality 3D imaging at 50 nm spatial resolution in a laboratory system

Non-destructive imaging with X-rays provides detailed 3D volumetric data of internal structures without the need for cutting or sectioning at the region of interest. The revolutionary UltraXRM-L200 from Xradia combines a high-flux laboratory X-ray source with proprietary X-ray optics into a standalone ultra-high resolution CT scanner, bridging the gap between existing high resolution imaging modalities such as SEM, TEM or AFM, and optical microscopy or traditional microCT.

Key Benefits

Highest resolution 3D X-ray imaging: uniquely in the lab, on demand

Non-destructive imaging allows repeated imaging of the same sample under varying conditions

Large working distance and atmospheric sample environment allow in situ studies

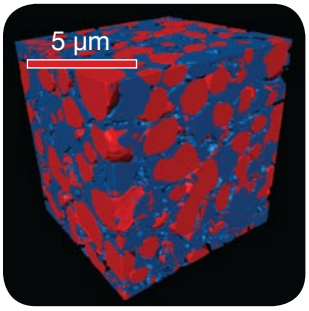
Unparalleled imaging quality for soft and low-Z materials and differentiation of phases of similar density using Zernike phase contrast mode

Applications

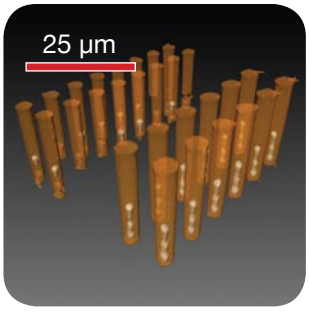
- **Oil & gas**
  Input data for pore space microstructure and flow modeling used for virtual core analysis
- **Materials Science & Engineering**
  Characterization of composite and other functional materials to understand properties such as porosity, cracks and phase distribution
- **Cellular research**
  Studies of fine and nanostructure in hard tissue (osteocyte lacunae and canalicular networks) and high contrast imaging of soft tissue (unstained and stained organelles)
- **Semiconductor**
  Process optimization and defect characterization for wafer-level packaging such as through-silicon via (TSV), MEMS, and failure analysis of interconnects

With a resolution as fine as 50 nm, the UltraXRM-L200 provides insight into microscopic structures and processes previously not accessible with conventional lab-based X-ray technology. Operating with 8 keV X-rays, providing excellent penetration and contrast for a wide range of materials, it enables observation of structures and materials in their natural state.

Xradia's integrated phase contrast technology employing the Zernike method enhances the visibility of grain boundaries and material interfaces when absorption contrast is low, enabling visibility of ultra- and nano-structures without staining. The UltraXRM-L200 delivers reliable internal 3D information otherwise only accessible by destructive methods like cross-sectioning.

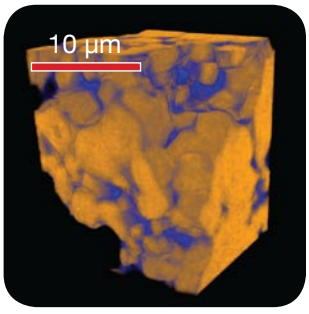


Solid Oxide Fuel Cell (SOFC)
Multi-phase Imaging



Through Silicon Vias:
Process Characterization & Failure Analysis

Osteocyte Lacuna with Canaliculi
Beyond Histology: Bone Research



Carbonate-Calcite Grains with Micrite
Rock Physics: Virtual Core Analysis

Image samples in background (from top to right): carbonate, concrete, network of cerebral vasculature, semiconductor packaging.

UltraXRM-L200 Nano-scale X-ray Microscope

Features

Automated image alignment for tomographic reconstruction

Integrated visible light microscope for easy sample alignment

Easy switching of magnification and contrast mode (absorption to Zernike phase contrast)

System

Key Specifications

Spatial Resolution	Field of View	Magnification
150 nm	65 µm	200x
50 nm	16 µm	800x

Components

Sample Stage

	X-Axis	Y-Axis	Z-Axis	Rotation
Travel	12 mm	10 mm	12 mm	± 140°
Load Capacity		1 kg		

X-ray Source

Source Type	Rotating Anode
Target Material	Copper
Max Voltage	40 kV
Min Voltage	20 kV
Max Power	1.2 kW
X-ray Photon Energy	8 keV
Radiation Safety	<1µS/hr

All specifications subject to change. Please consult Xradia for current specifications.

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