MicroXCT – 3D X-Ray Computed Tomography System

Innovative solutions for non-destructive 3D visualization with high resolution and contrast

MicroXCT: Innovation begins with new insight.

Xradia's MicroXCT is a suite of high resolution micro-CTs, designed with the ability to view "inside" your sample to see critical internal structures, features and defects for a wide spectrum of parts and materials. These samples can range from semiconductor packaging, MEMS, advanced materials, industrial components, medical implants, biological specimen, tissue samples to small live animals and plants. Like the traditional medical CTs, virtual slices of a sample can be made noninvasively at various planes, to visualize its 3D internal structure.

The MicroXCT sets new standards in resolution and contrast. Superior sub-micron spatial resolution

- Sub-micron structures and defects are easily and efficiently imaged.
- Superior CT resolution does not depend on submicron X-ray spot size or sample to source proximity.
- High resolution 3D tomography can be obtained with long sample to source working distance, compatible with relatively large or thick samples.

Dramatic, high contrast imaging with PhaseEnhanced™ optics

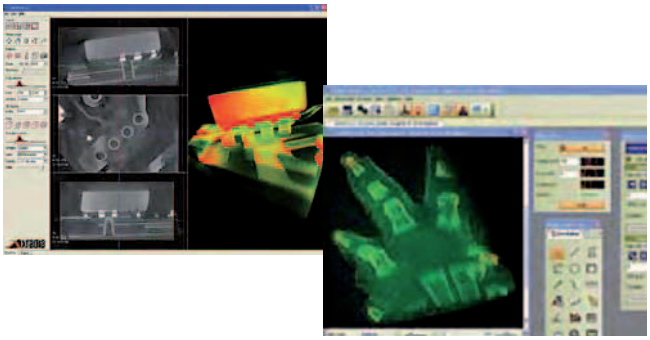
- Outstanding images obtained from both low z and high z materials, composites, polymers and biological samples.
- Absorption and phase contrast techniques for high quality imaging of difficult, low contrast specimens such as polymers and soft tissue.

Powerful control

The standard system includes a cluster workstation for fast 3D reconstruction and user friendly software for recipe creation, image enhancement, measurements, export of 2D and 3D images and CT movies for easy report generation.

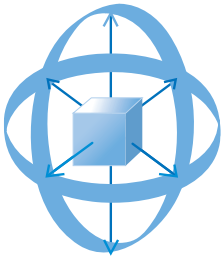
Advantages of MicroXCT

- Fast 2D and 3D artifact-free imaging and defect localization
- Non-invasive, visualization at micron level with sub-micron feature recognition
- High contrast imaging for Low Z materials and biological samples with Xradia's PhaseEnhanced™ Optics
- Programming for multi-region CT scanning of a sample for unattended operation
- Large working distance for experimental set up for high resolution, time-lapse imaging of functional devices and dynamic events



3D volume data set

The 3D image contains virtually all the structural information of the object, up to 2.000 physical cross sections down to 1 µm intervals. The reconstructed cross sections form a 3D virtual image that can then be manipulated and viewed in practically any manner or angle allowing you to "see inside" your sample and view internal structure by virtual cross-sectioning or de-layering.



IC packaging, MEMs, fiber optics and medical devices

The MicroXCT is a revolutionary 3D x-ray imaging technology for advanced IC packaging FA and R&D. Unlike conventional 2D x-ray projection systems, overlapping features from Flip-chip, CSP, stacked die, multi-chip modules, advanced packages with high density wiring schemes and PCBs can be spatially resolved with 3D tomography techniques.

The MicroXCT's compelling advantages come from its ability to routinely resolve "difficult to image defects" such as micro cracks, micro voids, invisible non wets in solder joints, high density wire shorts and open circuits, wire shift, die crack, substrate via and metal trace cracks, delamination and metal migration.

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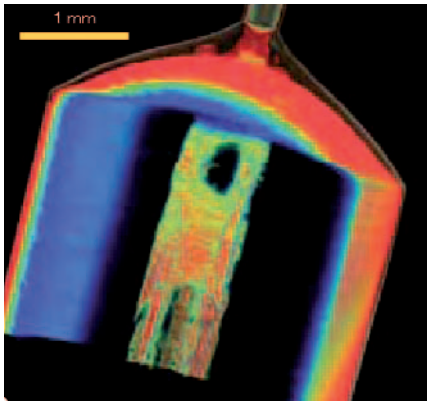
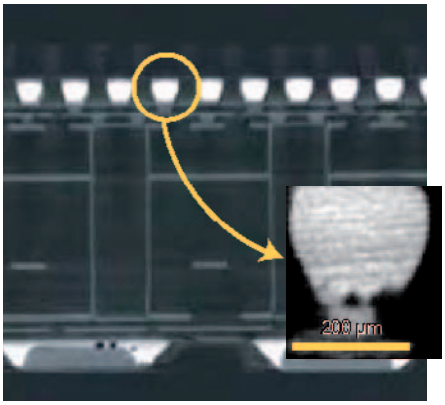
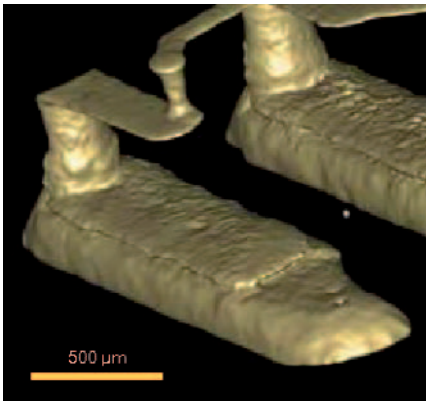


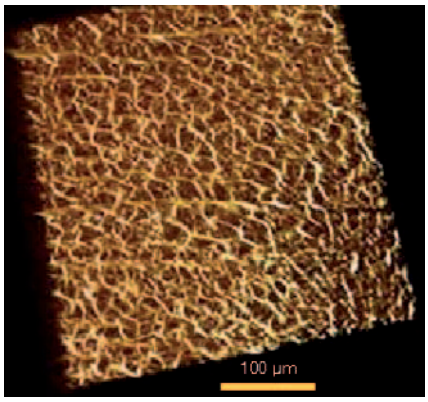
3D cut-out view of Fiber Optic Cable showing internal defects.



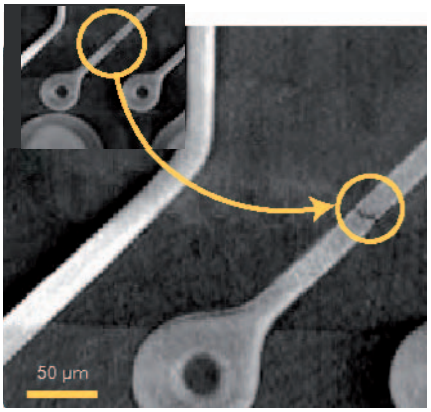
CT slice of semiconductor flip chip package. Insert shows high resolution of non wet solder defect in the C4 bumps.



3D image of an I.C. showing copper pads, posts and interconnects. Note cracks in copper pads.



Metal Foam for Laser Applications.



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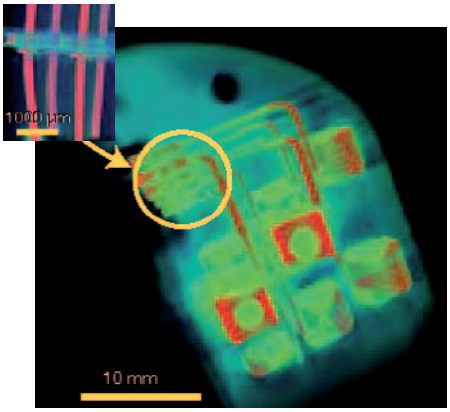

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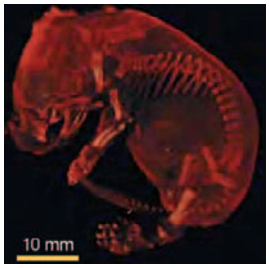
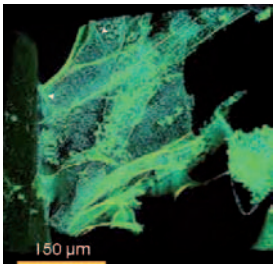
Ideal for materials research, biomaterials and life sciences imaging applications

The challenge in both 2D or 3D x-ray imaging has traditionally been with Low Z materials, since poor contrast cannot translate to good images. Increasing the resolution of the x-ray system would do little to help with these types of samples.

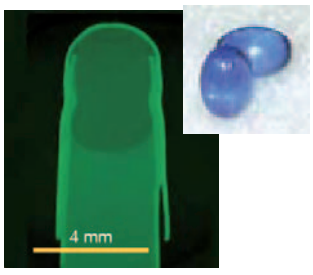
The high resolution and *PhaseEnhanced* ™ high contrast capability of the MicroXCT finds broad applications in imaging biological specimen, polymers, biocomposites in tissue engineering and nanotechnology. For example, biological soft tissue can be imaged at high resolution without the need for extensive sample preparation or the addition of contrast enhancing agents, making this technique a viable alternative to conventional histology. Polymers and their interfaces with metals and composites may be studied noninvasively, simplifying current inspection methodologies in orthopedic and medical device research.



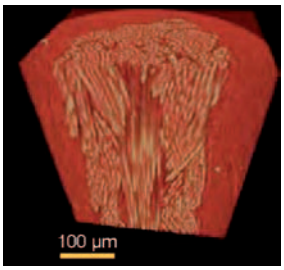
High contrast imaging of small animals. 3D X-ray of a whole mouse.



3D cellular distribution on polymer scaffold in tissue regeneration research.



Virtual cross-section of LiquiGel capsule showing voids and areas of poor adhesion. Low Z materials are easily imaged with excellent contrast.



Virtual histology of soft tissue without contrast agents or physical cross sectioning. Figure shows CT of human laryngeal nerve fiber bundle.