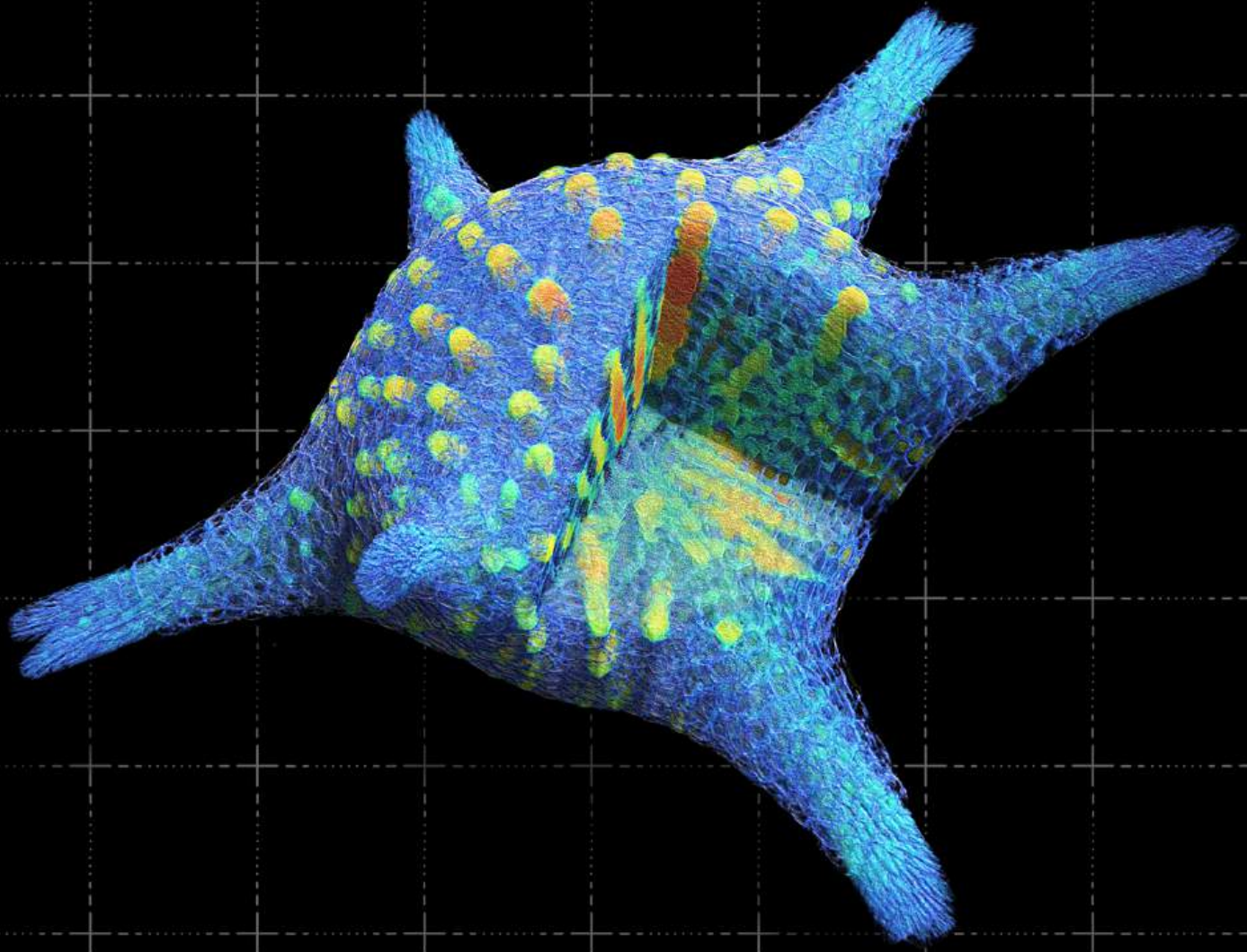
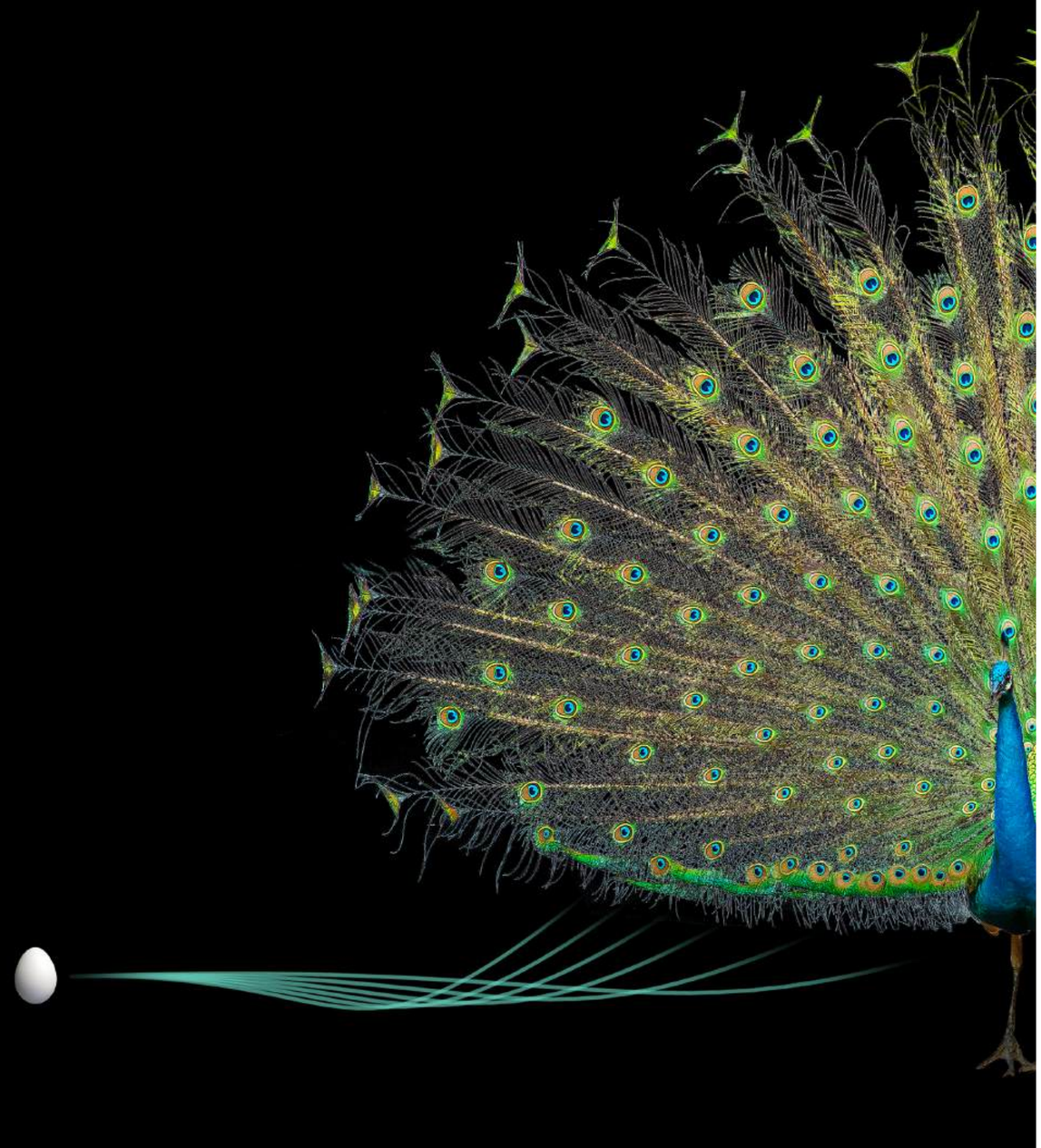
NEOSCAN



X-RAY MICROTOMOGRAPHY

MICROTOMOGRAPHY
FROM ORIGINS TO PERFECTION



X-Ray Microtomography or Micro-CT is an emerging microscopy technique for non-destructive visualization and measurement of an object's internal 3D microstructure at (sub-)micron level without any sample preparation



1980 Pioneering developments in microtomography started in **1980** as a part of the PhD project defended in **1983** by Alexander Sasov, current CEO and Founder of NEOSCAN

1983 The subsequent developments in micro-CT led to a large number of scientific publications, including a 24-pages overview published in **1987** in the Journal of Microscopy.

1987

1993 In **1993** Dr. Sasov installed the first micro-CT at the Department of Physics at the University of Reims in France.

1996 In **1996**, he co-founded the company SkyScan in Belgium, taking on the roles of CEO and lead designer of all SkyScan micro-CT instruments. Thanks to the innovative design, SkyScan became the leading global supplier of micro-CT systems. In **2012**, SkyScan was acquired by Bruker and renamed Bruker Micro-CT.

2012

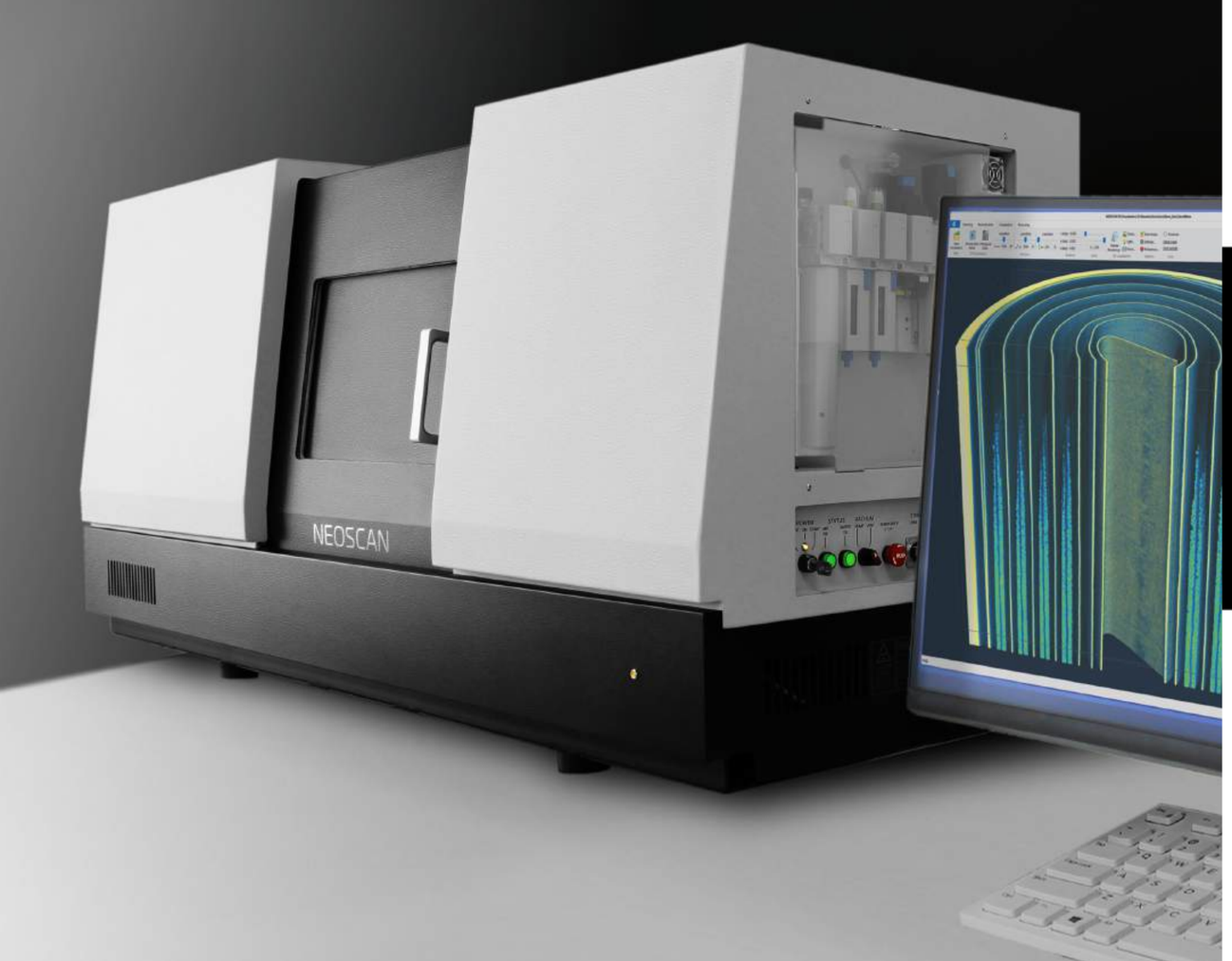
2019 To accelerate micro-CT innovations and reduce time to market, Dr. Sasov left Bruker and in **2019** founded NEOSCAN. Now, backed by a powerful, experienced, and dynamic team, four decades of micro-CT expertise have been converted into a wide range of high-end systems, serving scientists worldwide.

NEOSCAN developing accessible and highly "personal" desktop micro-CT instruments to revolutionize 3D microscopy, much like personal computers revolutionized the world 3 decades ago

PERFORMANCE	Amazing spatial resolution and image quality, fast scanning
RELIABILITY	Maintenance-free instruments, up to 10 years warranty
USABILITY	Effortless operation, license-free software, intuitive user interface
TRUST	Free software updates for life, exceptional customer support



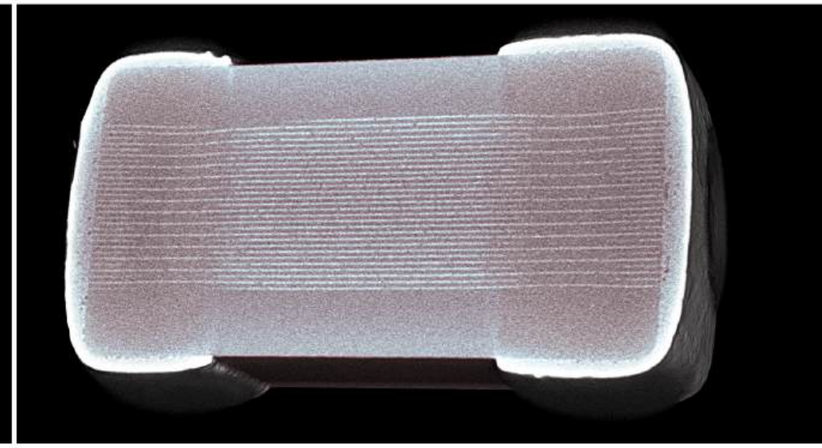
NEOSCAN N90
BENCHTOP NANOTOMOGRAPH



Neoscan N90 is the world's first bench-top nanotomography system.

Now researchers can get a highly personal and easy-to-use nano-CT on their desk with capabilities equal to or better than those of large, heavy and complex systems.

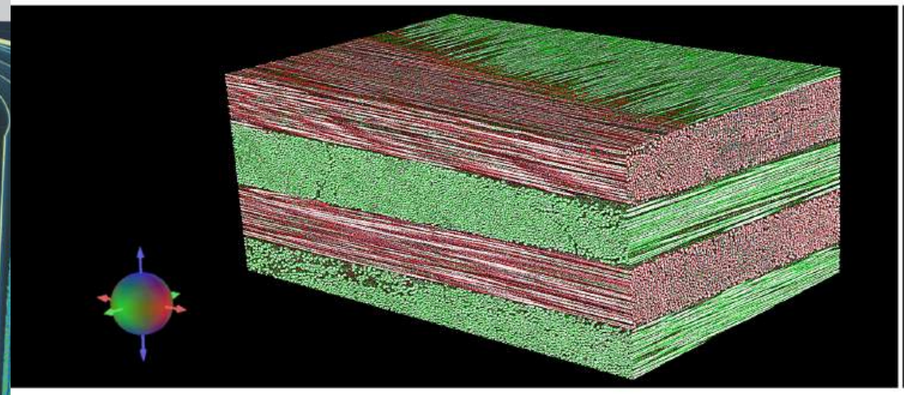
- 40 nm pixel size at highest magnification
- 300 nm resolution (JIMA resolution chart)
- 20-160 kV / 16 W X-ray source with diamond window
- Dual detector set-up: 27 MP CMOS + 7 MP flat panel
- Integrated anti-vibration granite platform with pneumatic leveling
- Powered from a standard wall socket 100-240 V / 750 W
- Small footprint of 1540 x 580 mm
- Optional integrated full-field micro-XRF for chemical mapping



▶ Multilayer ceramic capacitor (MLCC) 0.3 x 0.3 x 0.6 mm

volume rendering with virtual cut

175 nm voxel size



◀ Carbon-fiber reinforced polymer (CFRP).

220 nm voxel size.

1 x 0.7 x 0.5 mm volume inside 3 x 3 x 10mm block

volume rendering with color coded 3D orientation



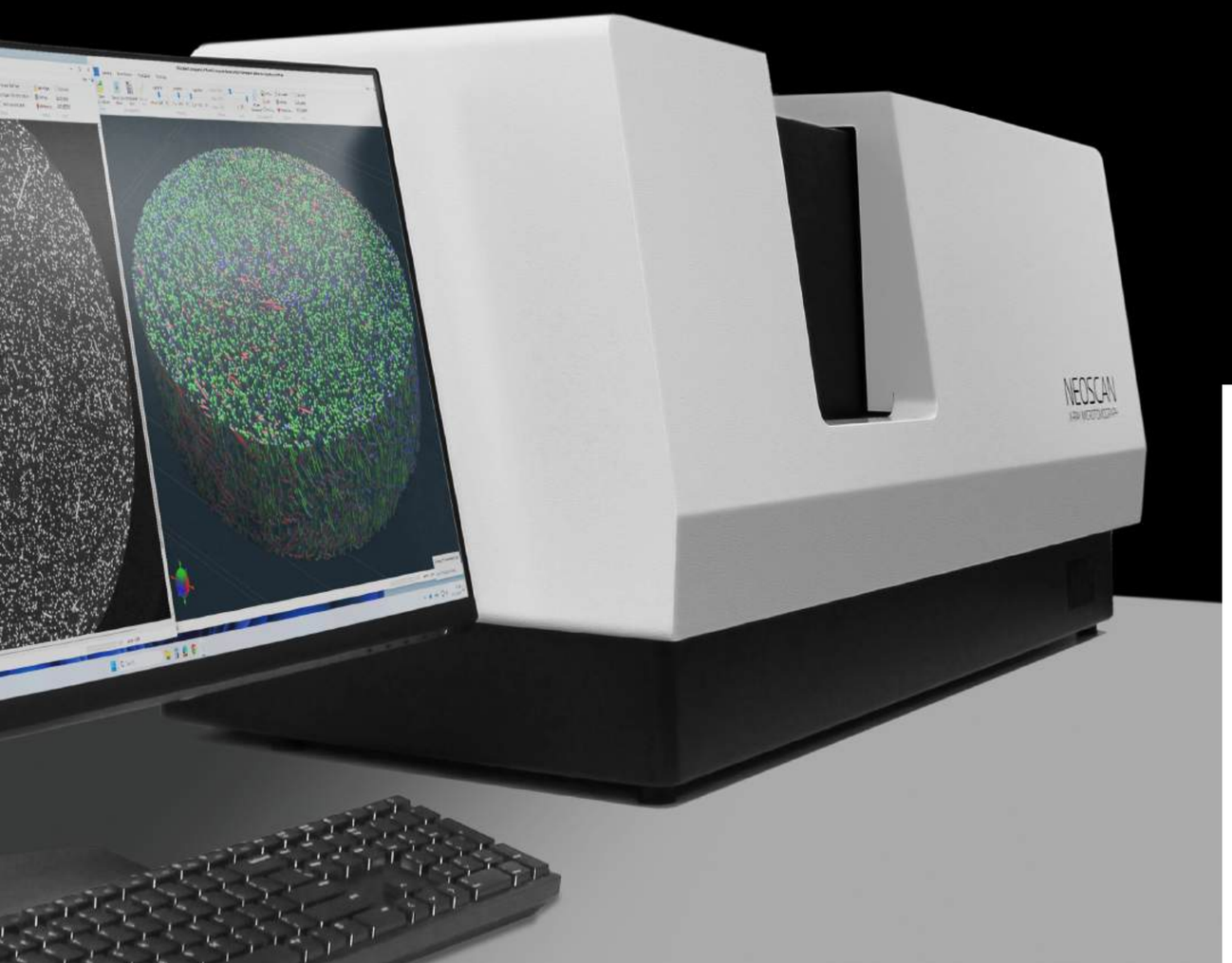
more details and examples

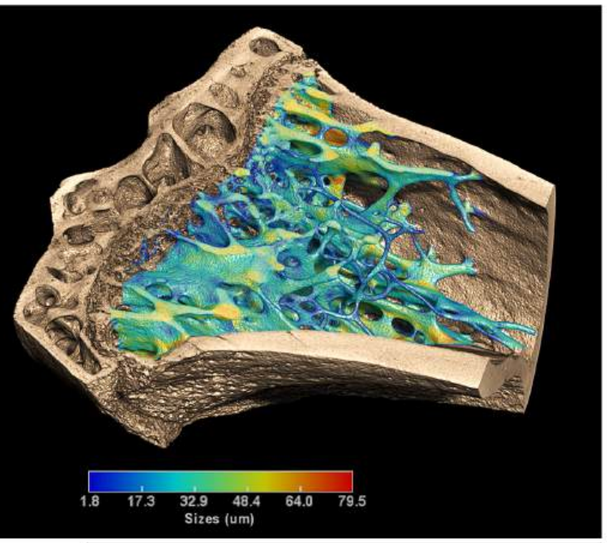
NEOSCAN N80

HIGH-RESOLUTION MICRO-CT

Neoscan N80 is a scientific grade high-resolution microtomograph.
The N80 houses a unique and innovative X-ray source allowing for highest-resolution scanning of large samples. The N80 is supplied with a flat-panel detector for fast scanning or with a CMOS detector for scanning at smallest pixel size.

- < 0.5 µm (CMOS) / < 1.2 µm (FP) pixel size at maximum magnification
- 20-110 kV / 16 W X-ray source, Tungsten on diamond target, 2 µm spot size
- 7 MP / 14-bit flat-panel or 27 MP / 16-bit CMOS radiation protected X-ray detector
- Max. scanning volume: 100 mm in diameter by 135 (CMOS) / 180 (FP) mm length
- Maximum object size 100 mm diameter x 220 mm length
- Round scan, multiple automatically connected scans, helical scans
- Active artifact elimination, phase-contrast retrieval
- Optional automatic sample changer, 24 positions
- 10 years or 10 000 h source operation (whichever comes first) standard warranty





▲
Mouse bone
volume rendering with virtual cut
1.8µm voxel size
color coded local trabecular thickness

Sandstone sample 5.8 mm in diameter
virtual slice
12 496 x 12 496 pixels, 0.51 µm pixel size
▼







more details
and examples

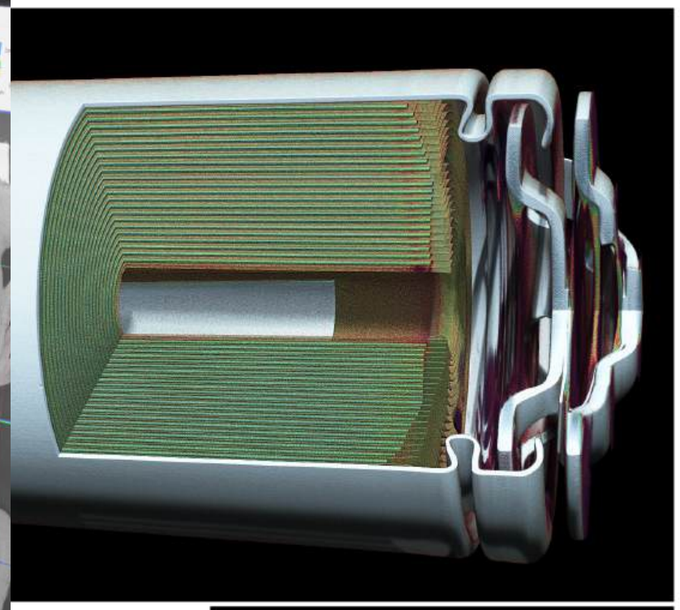
NEOSCAN N70

FAST AND ACCURATE MICRO-CT

Neoscan N70 is a fast, reliable and metrologically accurate microtomograph.

The combination of a powerful 100 kV / 20 W X-ray source and an efficient flat-panel detector, sensitive to high energies, makes N70 the system of choice for scanning dense and large samples. High dimensional accuracy and helical scanning makes it suitable for metrological applications.

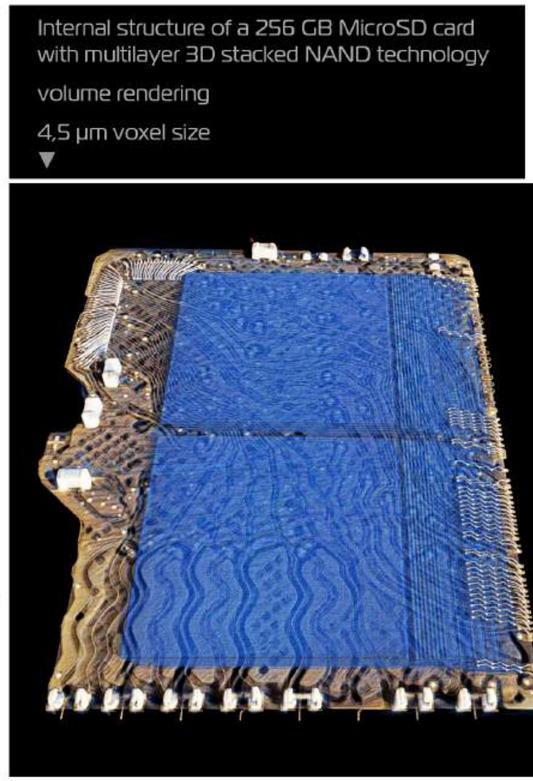
- < 2.5 µm pixel size at maximum magnification
- 4 µm spatial resolution (JIMA resolution chart)
- 20-100 kV / 20 W X-ray source
- Radiation protected 7 MP flat-panel X-ray detector
- Maximum scanning volume 100 mm diameter x 120 mm length
- Maximum object size 100 mm diameter x 220 mm length
- Round scan, multiple automatically connected scans, helical scans
- Optional automatic sample changer, 24 positions



Lithium-Ion battery type 18650

volume rendering,
front corner virtually removed

7.5 µm pixel size

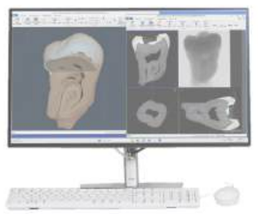


Internal structure of a 256 GB MicroSD card with multilayer 3D stacked NAND technology

volume rendering

4,5 µm voxel size





more details and examples

NEOSCAN N60

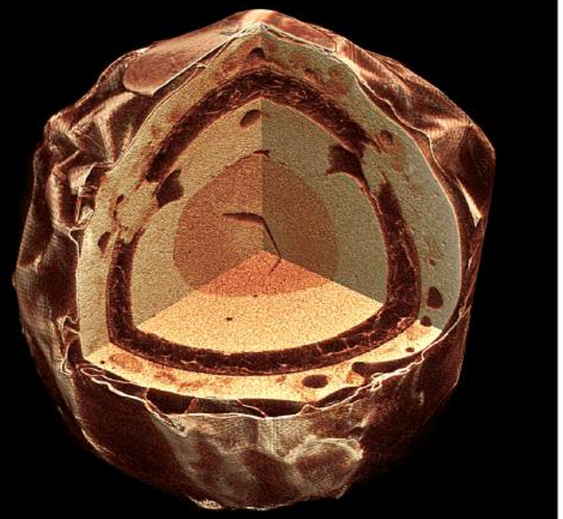
COMPACT MICROTOMOGRAPH



Neoscan N60 is an affordable compact microtomograph.

With N60, modern scientists can get a compact but very powerful tool for fast, non-destructive 3D imaging of a wide range of objects made from different materials.

- 3.8 µm smallest pixel size for any object size
- 8 µm spatial resolution (JIMA resolution chart)
- 20-65 kV / 50 W X-ray source
- Radiation protected 15 MP cooled CMOS X-ray detector
- Maximum scanning object diameter is 35 mm
- Up to 9K x 9K pixels in reconstructed virtual slices
- Very compact size, footprint only 80 x 31 cm, weight 45 kg
- Using single USB3 connection, it can work with both desktop PCs and notebooks



Human tooth

volume rendering with virtual cut

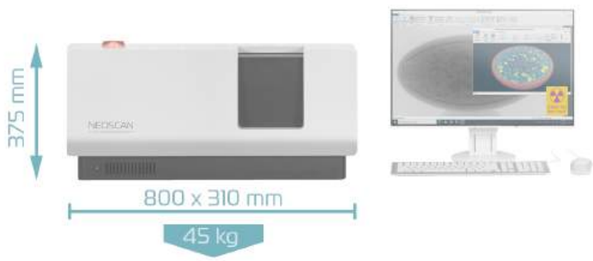
7.5 µm pixel size



Round biscuit with a whole hazelnut inside covered with chocolate and hazelnut crumble.

volume rendering,
front top corner virtually removed

15 µm pixel size



more details and examples

NEOSCAN NXL

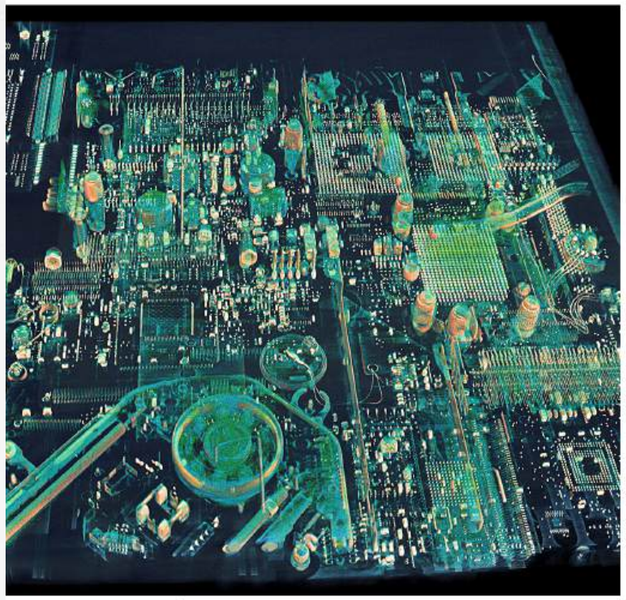
MICRO-CT FOR LARGE AND DENSE OBJECTS



Neoscan NXL is a unique bench-top scanner with high penetration power.

Due to the very powerful 150 kV / 75 W microfocus X-ray source and the large flat-panel detector, NXL can scan objects several hundreds mm in size, as well as objects with high X-ray absorption.

- 40 ... 150 kV / 75 W microfocus X-ray source
- 2.5 µm smallest pixel size at maximum magnification
- 5 µm spatial resolution (JIMA resolution chart)
- Radiation-protected 13.5 MP / 14 bit active pixel flat-panel X-ray detector
- Maximum scanned object size is 310 mm in diameter and 330 mm in length
- Maximum physical object size is 320mm in diameter and 540 mm in length
- Round scan, multiple automatically connected scans, helical scans



▲
15-inch notebook computer

semi-transparent volume rendering,

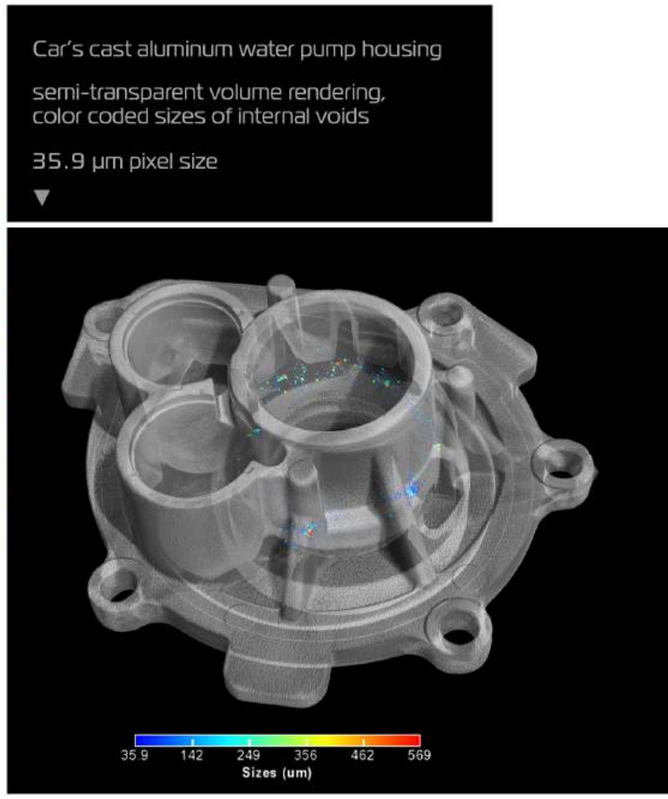
35 µm pixel size

Car's cast aluminum water pump housing

semi-transparent volume rendering,
color coded sizes of internal voids

35.9 µm pixel size

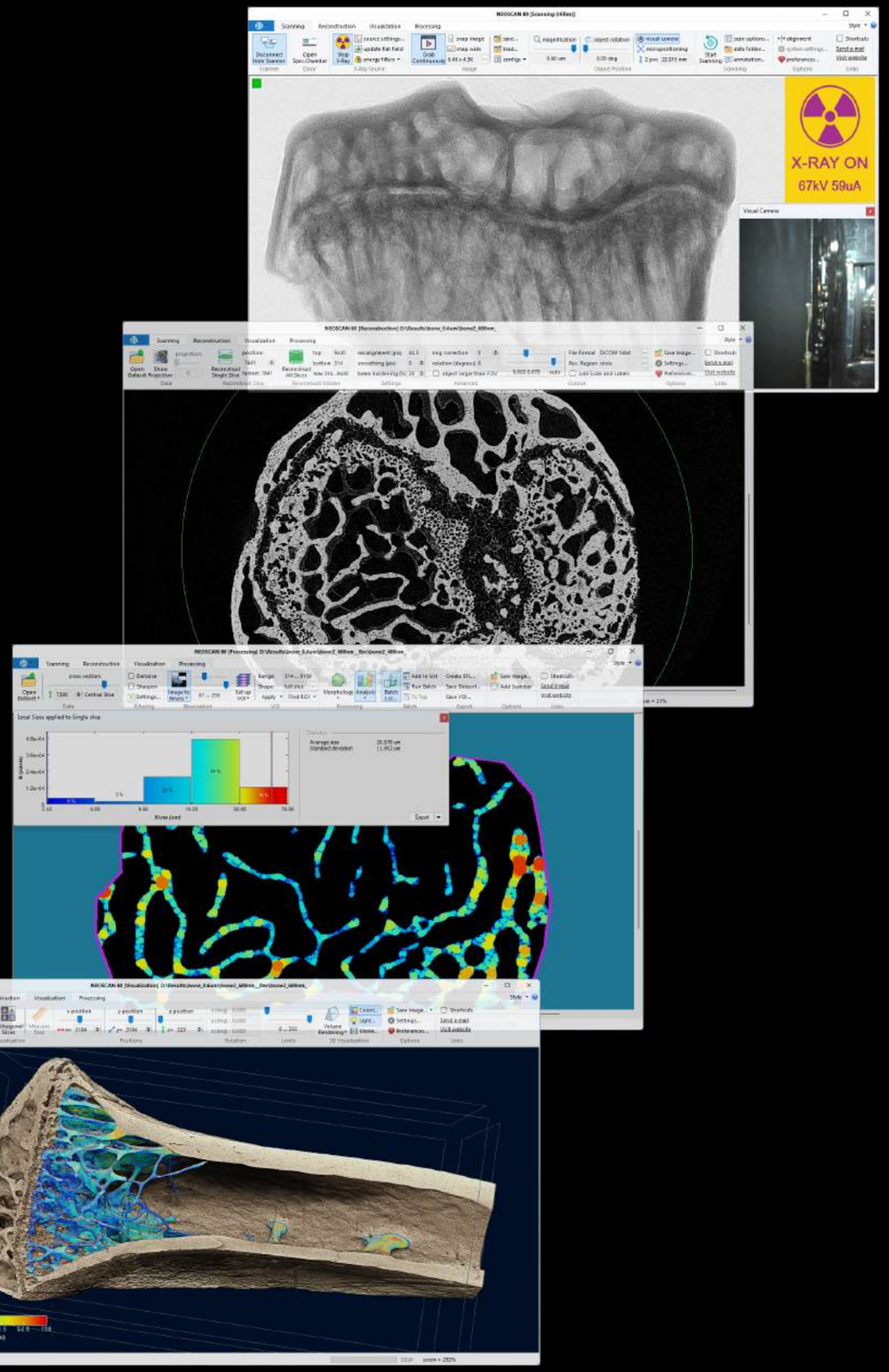
▼





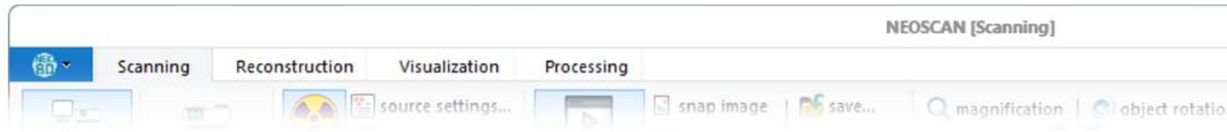
more details
and examples

NEOSCAN SOFTWARE



All NEOSCAN systems come equipped with a comprehensive integrated Software Package offering an intuitive ribbon-style user interface.

- All-in-one software package contains all functions for acquisition control, 3D reconstruction, realistic visualization, and 2D/3D image processing
- Multiple software instances can run simultaneously to perform tasks in parallel
- The license-free software package can be installed to multiple computers
- The software is covered by free, time-unlimited upgrades and updates



SCANNING

- System control, camera and source settings
- Interactive object positioning
- Scanning with round or helical trajectories
- Active artifact elimination

RECONSTRUCTION

- GPU-accelerated reconstruction for round or helical scans
- Automatic stitching of several partial scans to a single volume
- Automatic misalignment correction, as well as drift compensation
- Beam-hardening and ring artifact correction
- Interior reconstruction from truncated data
- Reconstruction with phase contrast retrieval
- Saving results as TIFF, BMP, JPG, PNG or DICOM

VISUALIZATION

- Show results slice-by-slice or as three orthogonal sections
- Measuring distances in 3D
- Virtual rotation of the reconstructed volume around any axis
- Realistic 3D volume rendering with colors/opacity selection
- Lighting, shadows, defining the object's surface properties
- Easy movie creation allowing to orbit and virtually clip the object

PROCESSING

- Sharpening, smoothing, denoising, binarization
- GPU-accelerated 2D/3D analysis of volumes, sizes and shapes
- Defining volume-of-interest by standard shapes or free-drawing
- Local fiber orientation analysis based on half-tone or binary images
- Morphological operations: erosion, dilation, despeckling, shrink-wrap,...
- Numerical analysis outputs and color-coded 3D maps
- Surface rendering with export in STL format for 3D printers
- Creating batch lists to be applied to multiple datasets



more details

ESSENTIAL ACCESSORIES



Automatic Sample Changer for N70 and N80 micro-CT systems

- 24 positions with indication of sample status by illuminated color bars,
- Being outside the shielded area, scanned samples can be replaced anytime
- Scanning protocol for every sample can be defined individually, either by operator or selected automatically
  - Optimal magnification based on object dimensions
  - X-ray source settings optimized according to object's absorption

more details



Cooling-Heating Stage for N70, N80, N90, NXL

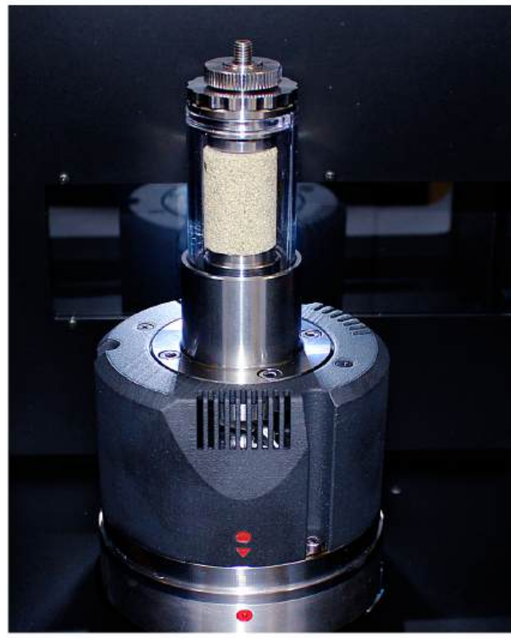
- Provides both cooling and heating capabilities
- Maintains object's temperature during scanning
- Minimum temperature: 40°C under ambient
- Maximum temperature: +120°C

more details and examples

Compression-Tensile Stage for N70, N80, N90, NXL

- *In-situ* scanning under pressure or tension
- Adjustable loading speed 0.3 ... 3.3 mm/min
- +1000 N maximum compression force
- – 1000 N maximum tensile force
- >10 mm displacement travel

more details and examples



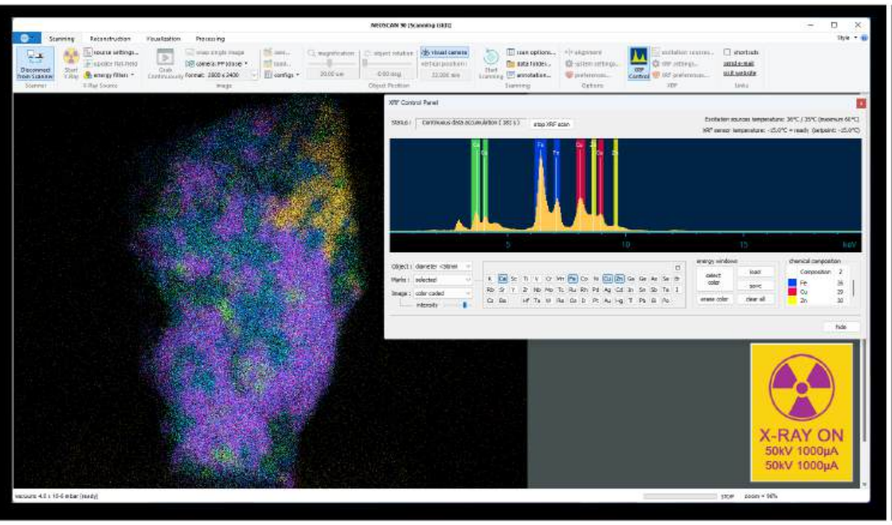
UNIQUE OPTIONS:

- INTEGRATED MICRO-XRF
- 3D NEOSPACE STATION



Integrated full-field micro-XRF subsystem for chemical mapping in N90 nano-CT opens unique possibilities for detecting elemental distribution on the sample surface, which can then be correlated with CT-results to obtain a 3D elemental map.

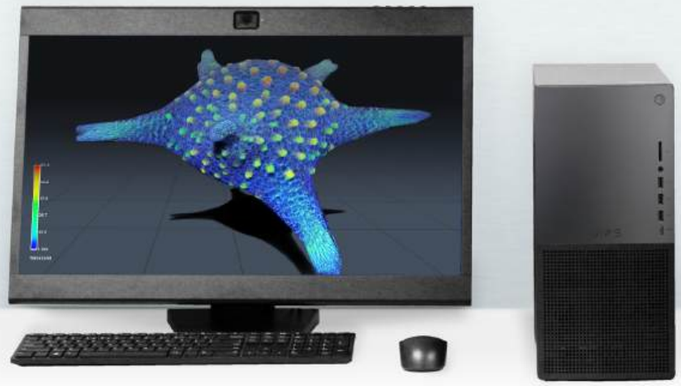
- The Micro-XRF module is fully integrated inside the N90 body and software
- XRF excitation is provided by two 50 kV / 50 W X-ray sources
- Pinhole optics in the XRF detector allows mapping objects of any shape
- A 4Mp detector measures the energy of every incoming X-ray photon, emitted by the object with a characteristic energy defined by the local chemical composition



more details and examples

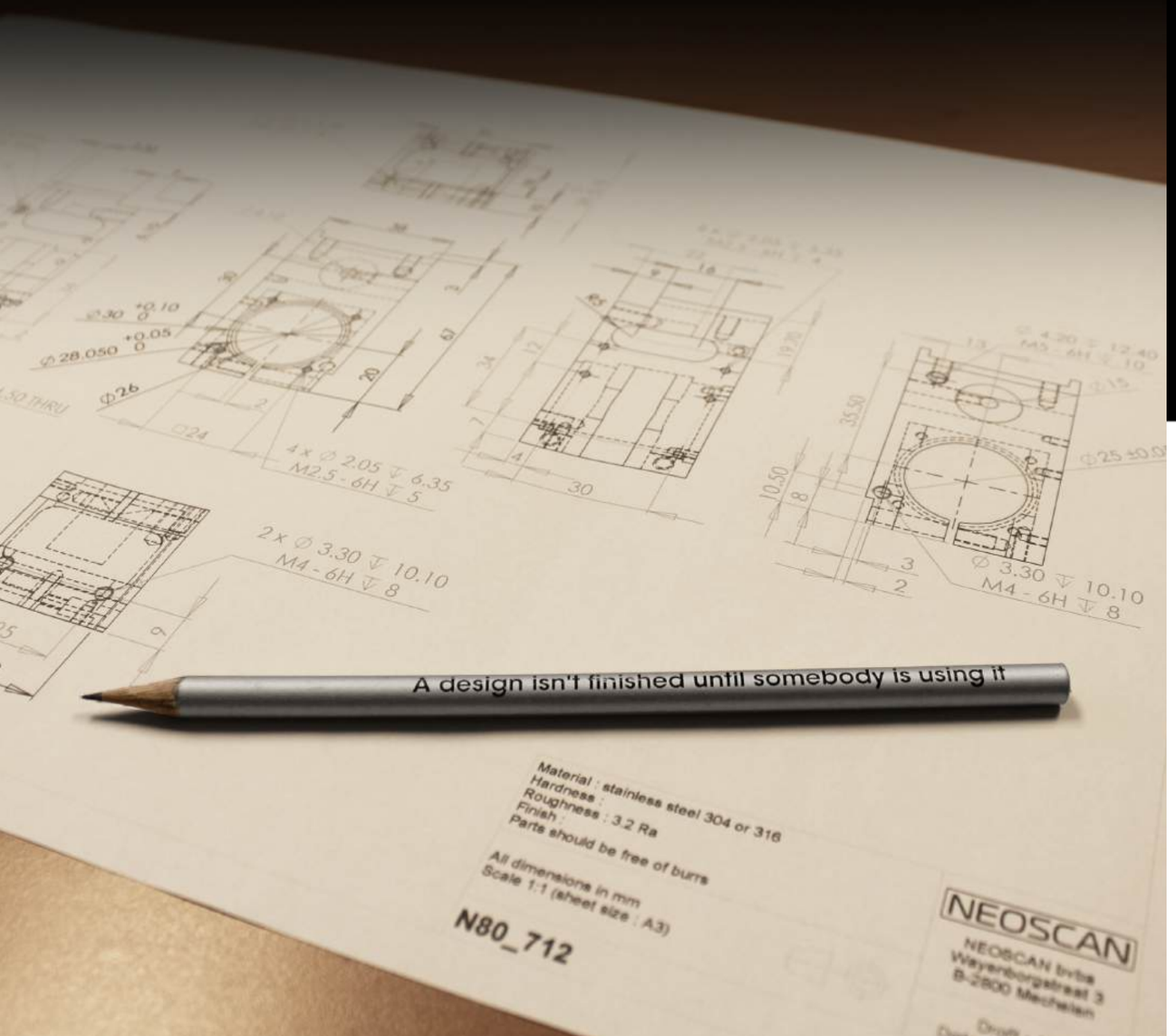
3D NeoSpace Station provides real-time 3D viewing, without the need for glasses, for the most immersive experience.

- A 3D Display delivers spatial reality with unlimited spatial depth due to real time eye-tracking technology
- The NeoSpace software allows interactive 3D spatial rendering of an object's internal microstructure from various angles, with the possibility for object manipulations, virtual clipping, and creation of 3D movies
- A powerful computer runs the sophisticated software package to visualize 3D objects anywhere in the space above and behind the screen without any glasses or headset



more details

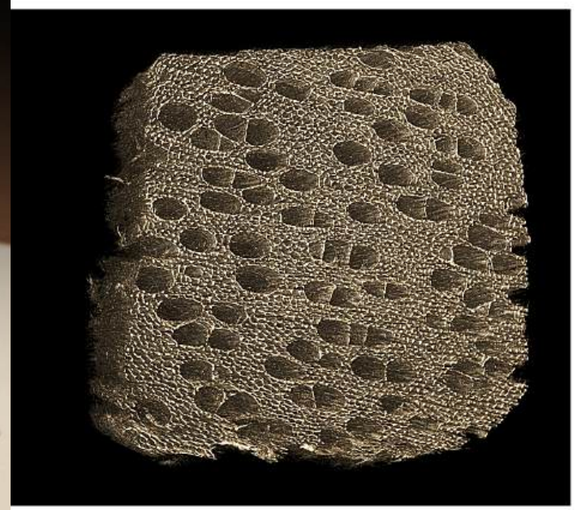
NEOSCAN
CUSTOM BUILT SYSTEMS AND ACCESSORIES



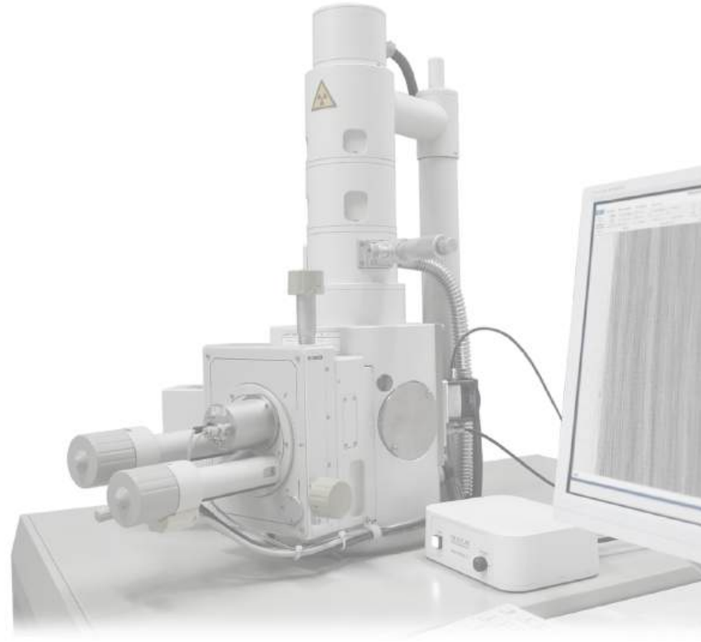
Using decades-long expertise, Neoscan is open to create custom-built systems and accessories tailored to the wishes and dreams of scientists. A few examples:

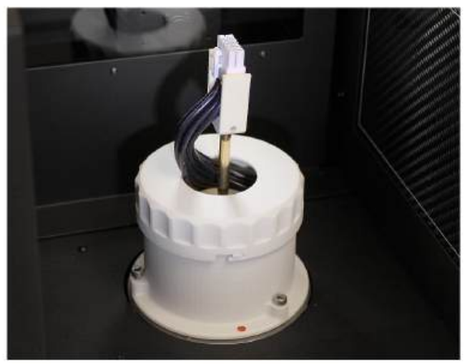
inSEM-CT is a microtomography set-up integrated in a Scanning Electron Microscope (SEM) allowing imaging through the objects and performing 3D reconstruction of object's internal micro structure without compromising any SEM imaging capabilities.

- *inSEM-CT* uses the SEM's electron beam to generate X-rays
- Vacuum compatible micro scanner performs object rotation and magnification control
- Direct detection X-ray camera on the side flange of SEM produces X-ray images
- Compact bench-top controller provides communication with software
- The system includes software for acquisition, reconstruction, visualization and analysis
- 500 nm smallest voxel size, 4 mm maximum object's scanning diameter
- Non-conductive objects can be visualized and scanned without any coating



▲ Wood
volume rendering
1.3 µm voxel size





On customer's requests, Neoscan can design and produce special scanning accessories such as application-specific sample mounts

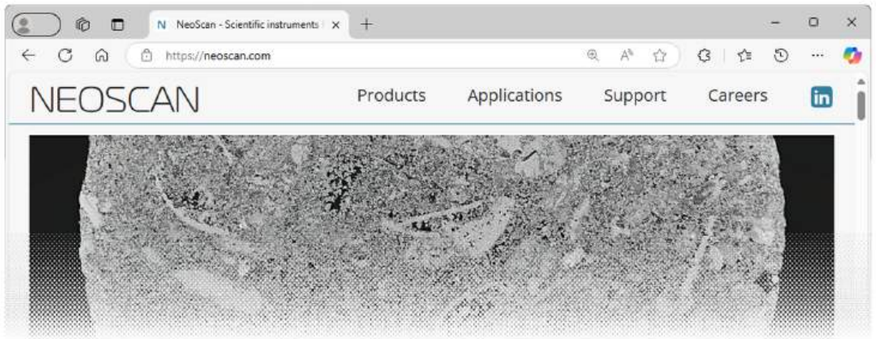
This example shows a special holder for inspection of automotive connectors. The connector holder is attached to the micro positioning stage for optimizing scanning position, while the long wires are wrapped into 3D-printed container outside the scanning area.

NEOSCAN MICRO-CT

CREATED IN THE HEART OF EUROPE
FOR SCIENTISTS AROUND THE WORLD



neoscan.com serves as the primary gateway for technical and application-related knowledge



- specifications for all Neoscan systems and accessories
- application examples from different areas
- location and contact information
- career opportunities

rapidly expanding NEOSCAN's distribution network



NEOSCAN designs, redefines and manufactures personal high-performance benchtop microtomography instruments, offering an enjoyable operating experience and long-lasting lifetime.

We bring cutting-edge micro-CT technology at your fingertips, enabling you to discover and analyze the captivating 3D microworld.

Have inquiries or interest in a demo? Contact us to discover how our systems can solve your specific application needs.

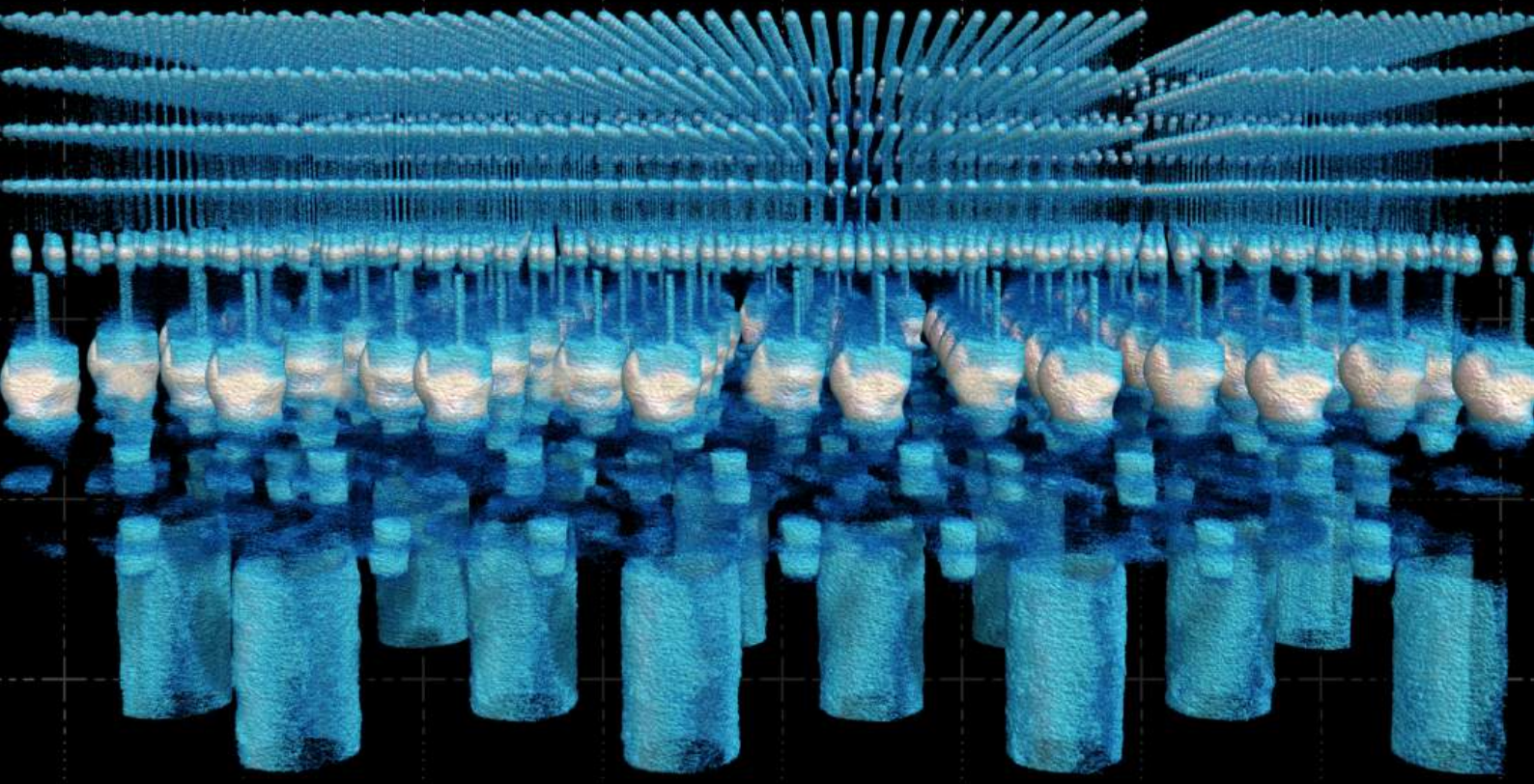
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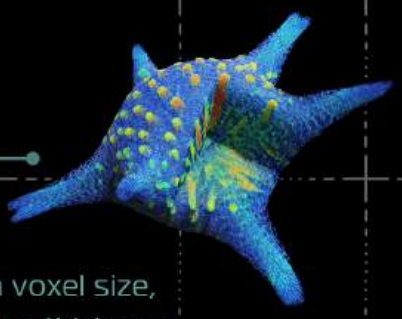
info@neoscan.com

Wayenborgstraat 3, Mechelen, 2800 Belgium

inside advanced GPU with 3D-stacked memory:

stacked layers of High Bandwidth Memory (HBM)
interconnected by vertical Through-Silicon Vias (TSV)
NEOSCAN N90, 500nm voxel size in 30x40mm GPU





on the front cover

grain of Star Sand
from Okinawa, Japan.
NEOSCAN N90, 550nm voxel size,
color-coded local structure thickness;
front right corner virtually removed