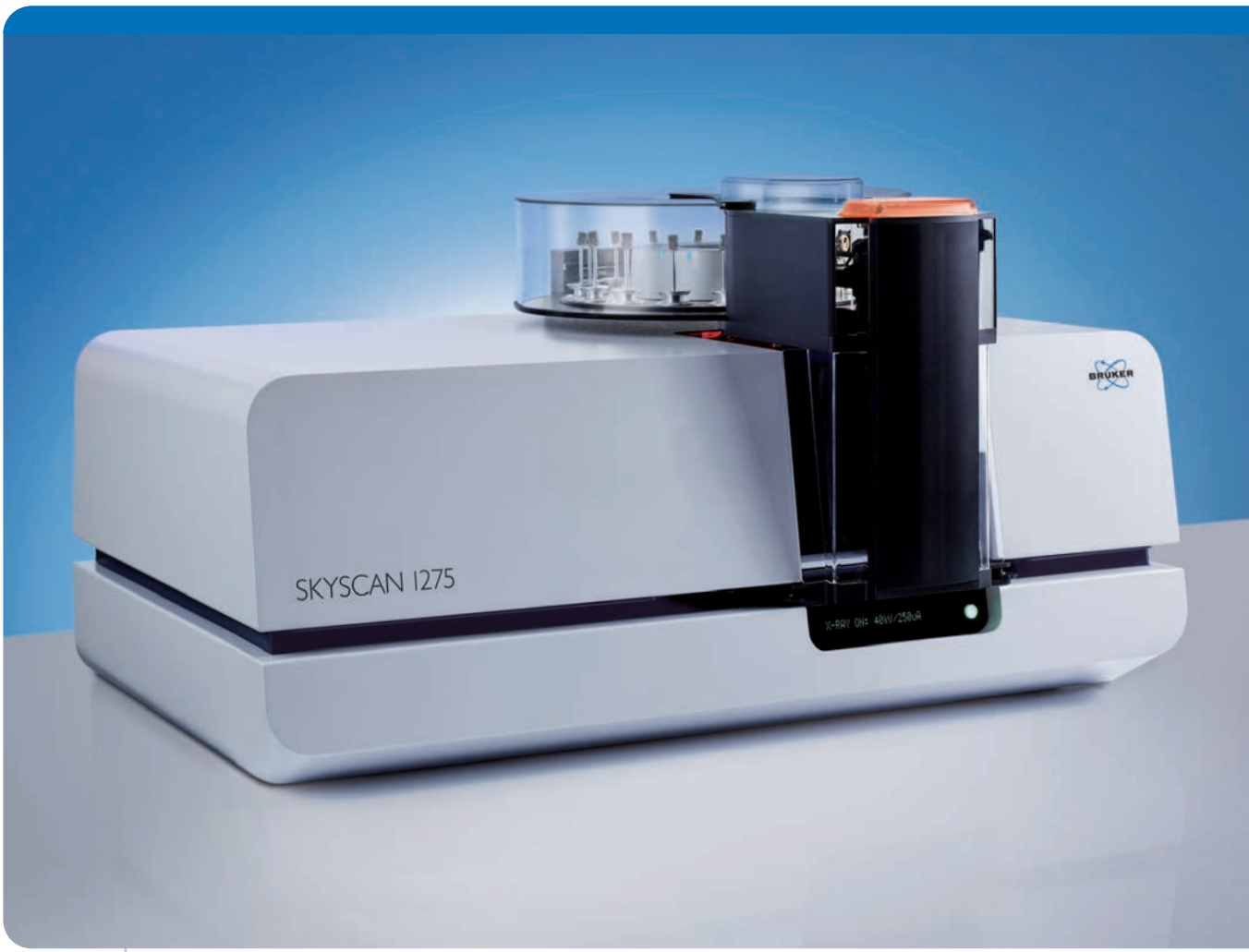


SKYSCAN 1275

- 3D X-ray Microscopy Solutions

Innovation with Integrity

Geology, Oil & Gas

- Measure pore network properties, grain size, and shape
- Calculate distribution of mineral phases in 3D
- Digitize a 3D volume of precious samples, e.g. archeological finds
- Analyze dynamic processes

Pharmaceuticals & Packaging

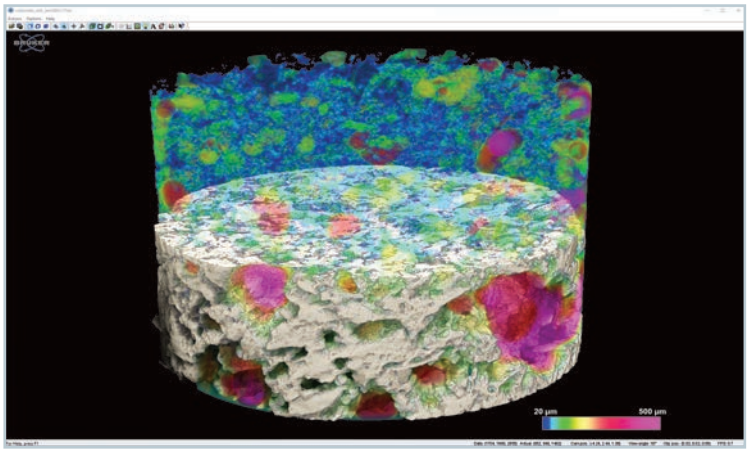
- Measure coating thickness and distribution of active ingredients
- Measure external and internal dimensions and detect defects
- Implement high-throughput scanning of medical devices
- Investigate pharmaceutical packaging up to a size of 10 cm x 10 cm x 10 cm
- Monitor and control the quality of metal and plastic components

Automotive & Electronics

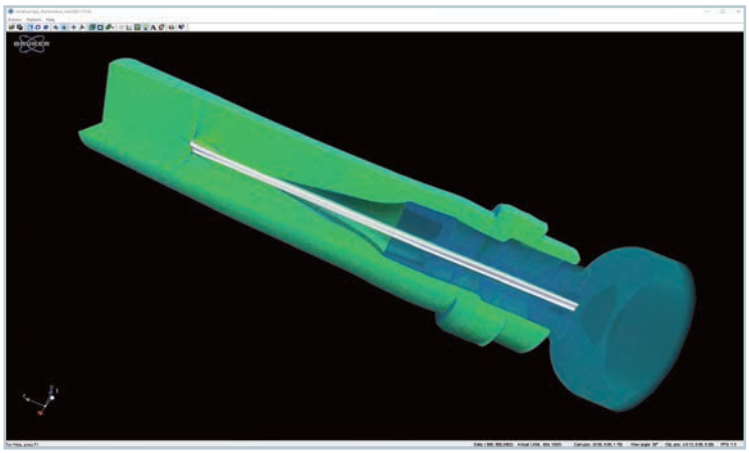
- Detect defects in metal parts
- Evaluate connections non-destructively
- Analyze manufactured components automatically
- Operate the system at-line

High Throughput & 4D CT

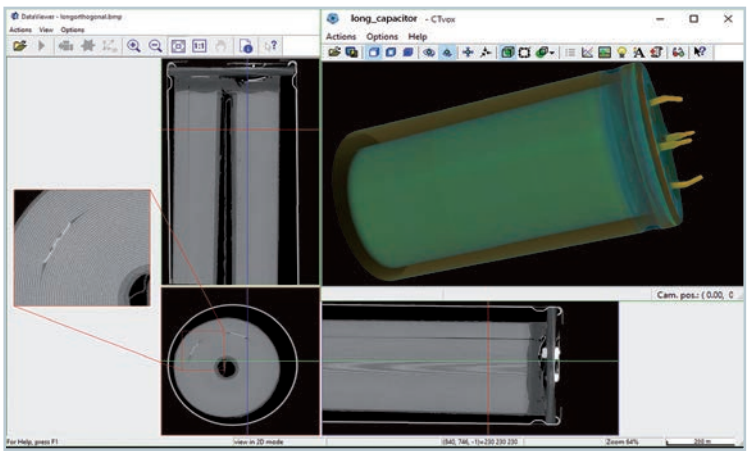
- Add time, force or temperature as a fourth dimension to 3D studies
- Apply in-situ mechanical tests with compression and tensile stages
- Visualize fluid flow, crystallization, dissolution and other processes in porous media
- Measure samples in non-ambient conditions



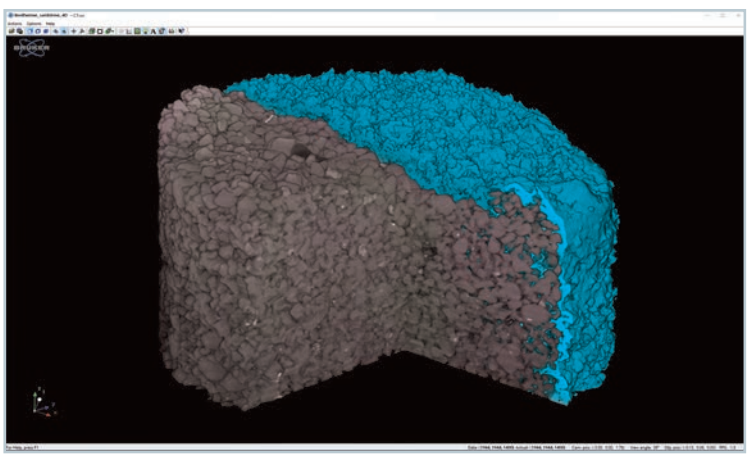
3D reconstruction of the internal microstructure of a carbonate, volume rendering with top half virtually removed overlapped with color map of local pore sizes
20 µm voxel size, 80 kV, 1 mm Al filter, 1,944 x 1,944 x 2,925 px – 35 mm sample size



3D reconstruction of a syringe with a cap
8 µm voxel size, 70 kV, 1 mm Al filter, 1,944 x 1,944 x 3,980 pixels – 6 mm sample size



Orthogonal slices and volume render of a large capacitor.
25 µm voxel size, 100 kV, 1 mm Cu filter, 1,944 x 1,944 x 6,000 px – 40 mm sample diameter



Volume render of salt crust on a Bentheim sandstone.
5 µm voxel size, 80 kV, 1 mm Al filter, 1,944 x 1,944 x 1,536 px – 6 mm sample diameter

SKYSCAN 1275 –
3D X-ray Microscopy for Everyone

The SKYSCAN 1275 is an unparalleled desktop 3D X-ray microscope based on micro computed tomography (Micro-CT). This non-destructive imaging technology, pioneered by Bruker, uniquely provides 3D insights into samples of any material, any shape, and any size with little to no sample preparation. SKYSCAN 1275 makes this attractive technology available to everyone. This desktop instrument fits in every lab and excels in easy-of-use thanks to the high level of automation.

SKYSCAN 1275 – Plug'n Analyze™ the internal structure of your sample.

SKYSCAN 1275 Just Push a Single Button to Take-off With the Fastest Desktop XRM!

SKYSCAN 1275 high-speed X-ray microscope with Push-Button CT

Various sample holders and in-situ stages

No sample preparation needed

Ultra-high speed, amazing images

The SKYSCAN 1275 is designed for fast scanning of a wide range of samples. Using a powerful X-ray source (100 kV) with a wide opening angle and a very efficient and large flat-panel detector, the system scans even big samples with ease. By combining short source-to-detector distance and fast detector readout, the SKYSCAN 1275 reduces acquisition times dramatically – from hours to minutes – without compromising image quality. SKYSCAN 1275 is so fast, it even performs 4D CT.

Ultimate simplicity with Push-Button-CT™

Just insert a sample, manually or automatically, and get a complete 3D volume without any further interaction. Push-Button-CT includes everything: automatic sample size detection, sample scanning, 3D reconstruction, and 3D volume rendering. Combine it with a sample changer and SKYSCAN 1275 even works 24/7.

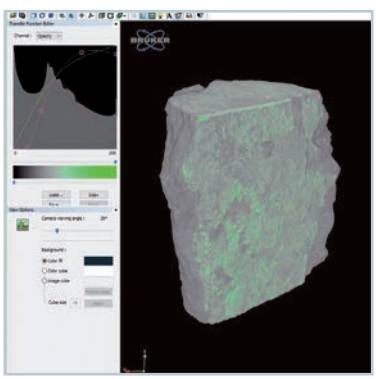
Full flexibility, full functionality

Besides running in Push-Button-CT mode, the SKYSCAN 1275 offers all the features experienced users expect in an XRM system. Each measurement can be set up manually, ensuring the optimal parameters for challenging samples. Even at resolutions below 5 µm, typical scan times are less than 15 minutes.

No hidden costs: a maintenance-free X-ray microscope

Our sealed X-ray tube allows running 24/7 without the frequent downtime required for changing a broken filament, saving you a lot of time and money.

Press once to start Push-Button-CT


Automated reconstruction & 3D visualization

#1

Insert first sample — 10 s

Push to start — 5 s

Automatic sample size detection — 10 s

Automatic scanning — ~80 s

Change samples — 10 s

Automatic 3D reconstruction — ~40 s

Automatic 3D visualization — ~40 s

Time to result #1 ~**3** min*)

#2

10 s
5 s
10 s
~80 s
10 s
~40 s
~40 s

#2 ~**5** min*)

#3

10 s
5 s
10 s
~80 s
10 s
~40 s
~40 s

#3 ~**7** min*)

Start a new sample every two minutes, while 3D reconstruction and volume rendering run independently

Thanks to Push-Button-CT, an operator simply loads the samples and pushes the button to start the sequence. With the optional sample changer, the loading process can be automated to start 16 samples at once. In addition, a user can easily insert a priority sample at the next position while a Push-Button-CT scan at the previous position is still running.

* typical times, may vary depending on sample properties and scan settings

Push-Button-CT is the easiest and most foolproof way to perform sophisticated high-speed X-ray microscopy.

This is what the operator needs to do:

Insert the sample, push the button, and change the sample after the scan. Add the 16-position sample changer and the operator doesn't even have to push the button every time.

This is what happens behind the scenes:

Planning:
First, an experienced user creates or selects a Push-Button-CT sequence. Everything from sample size to 3D volume rendering can be easily automated and tailored to perfectly fit the sample.

Scanning:
After receiving the sample, the system recognizes the size of the sample and selects the optimal magnification. If the size is known already, this step can be skipped and integrated into the Push-Button-CT sequence. Then, the data acquisition starts with the predefined settings. When the first sample is done, it is replaced by the next one and the scanning cycle starts again.

Processing and visualizing:
While the actual scan is running, the Push-Button-CT sequence works on the previous sample. This parallel processing reduces the overall measurement time dramatically. The system then performs the next steps of the Push-Button-CT sequence, 3D reconstruction and 3D visualization. Due to GPU acceleration, SKYSCAN 1275 is up to ten times faster than a conventional system with CPU-based reconstruction.

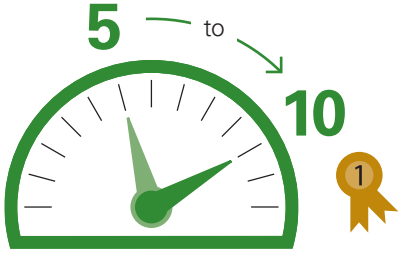
Now the results are ready to use and the SKYSCAN 1275 sends an email with a link to the results.

This is what SKYSCAN 1275 with Push-Button-CT offers:

A complete 3D volume within minutes, foolproof operation with maximum ease-of-use, and X-ray vision for everyone!

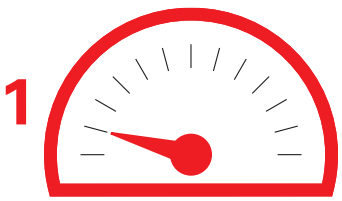
Ultimate Simplicity with Push-Button-CT™! Just Press Once and Get a Complete 3D Volume!

SKYSCAN 1275 with GPU Acceleration



Speed Factor

Conventional Systems with CPU-Based Reconstruction



A Racehorse at Work – 24/7! High Throughput at High Speed with SKYSCAN 1275

A racehorse is known for being very fast, not for running all day long, while a workhorse is vice versa. We invented an XRM "racehorse" with the power and endurance of a reliable "workhorse" for 24/7 operations: the SKYSCAN 1275.

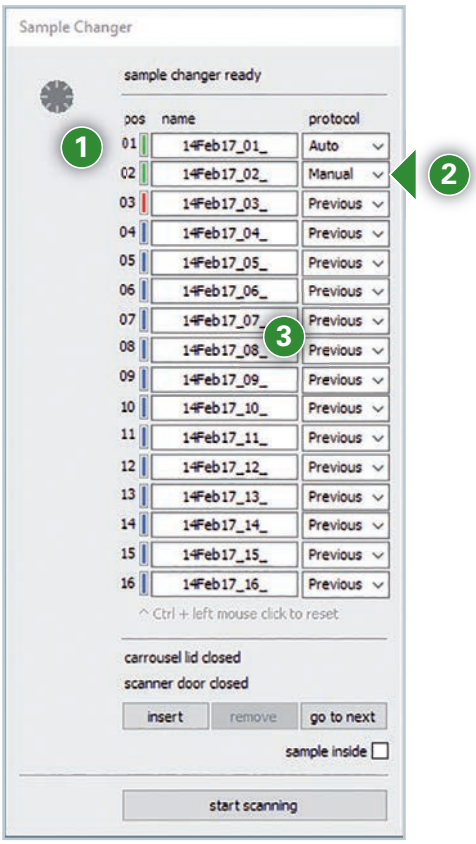
The SKYSCAN 1275 with an optional 16-position sample changer can be operated in three ways:

1) Fully automatic
Simply load the sample changer, select "Auto" protocol with your predefined Push-Button-CT sequence, and then let the SKYSCAN 1275 take care of the rest! All scan, processing and visualization settings are predefined in your Push-Button-CT sequence. Feel confident that your work is being done – all day, all night, or over the weekend – with system-generated reports emailed directly to your inbox, including a link to access data remotely.

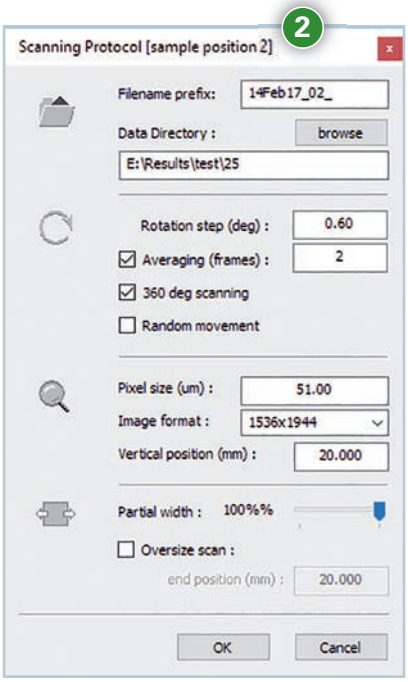
2) User selected
Want more control? Individually adjust scan parameters for one, some, or all sixteen samples. Once all "Manual" protocols are defined, simply press "Start" to initiate the full batch.

3) Prior Selection
Streamline workflow by using the "Previous" command to assign the last settings.

Stay in charge, always. Because the sample changer operates outside the fully shielded X-ray chamber, a user can easily place a priority sample at the next position while a Push-Button-CT scan is still running.



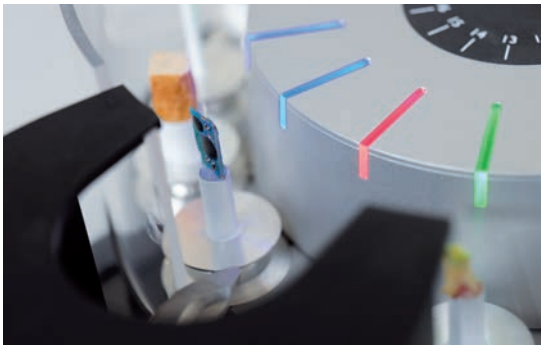
Sample changer window



Scanning protocol window

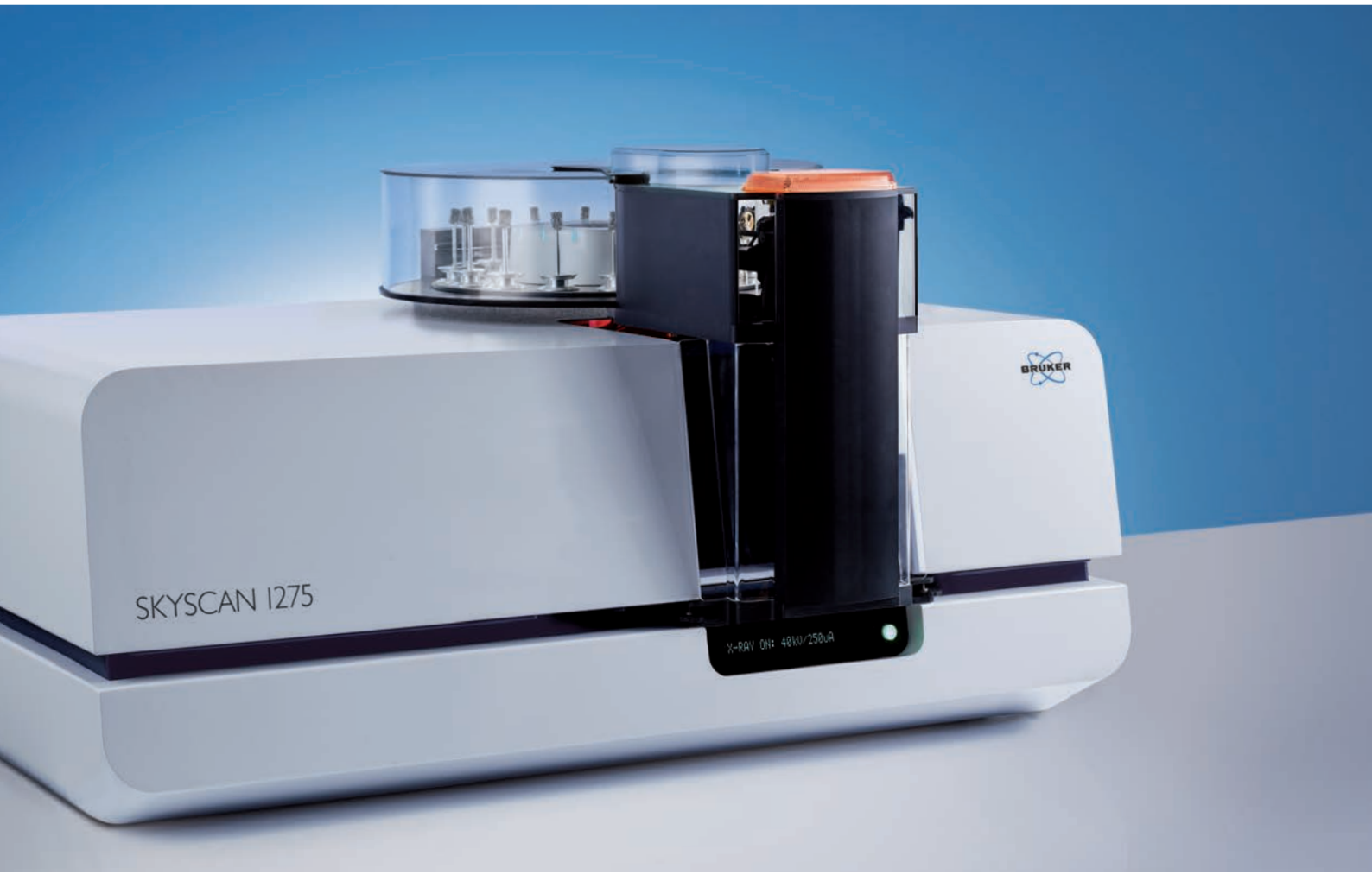
Scanning 16 samples made easy!
Video at:
www.bruker.com/SKYSCAN1275-Video1

1. Status display of all 16 positions
2. Automatic or user-selected parameters
3. Scan samples with the previous protocol



Autodetection of new samples and status LEDs for every scan: ready, running, done

Change samples at any time without interrupting an ongoing scan



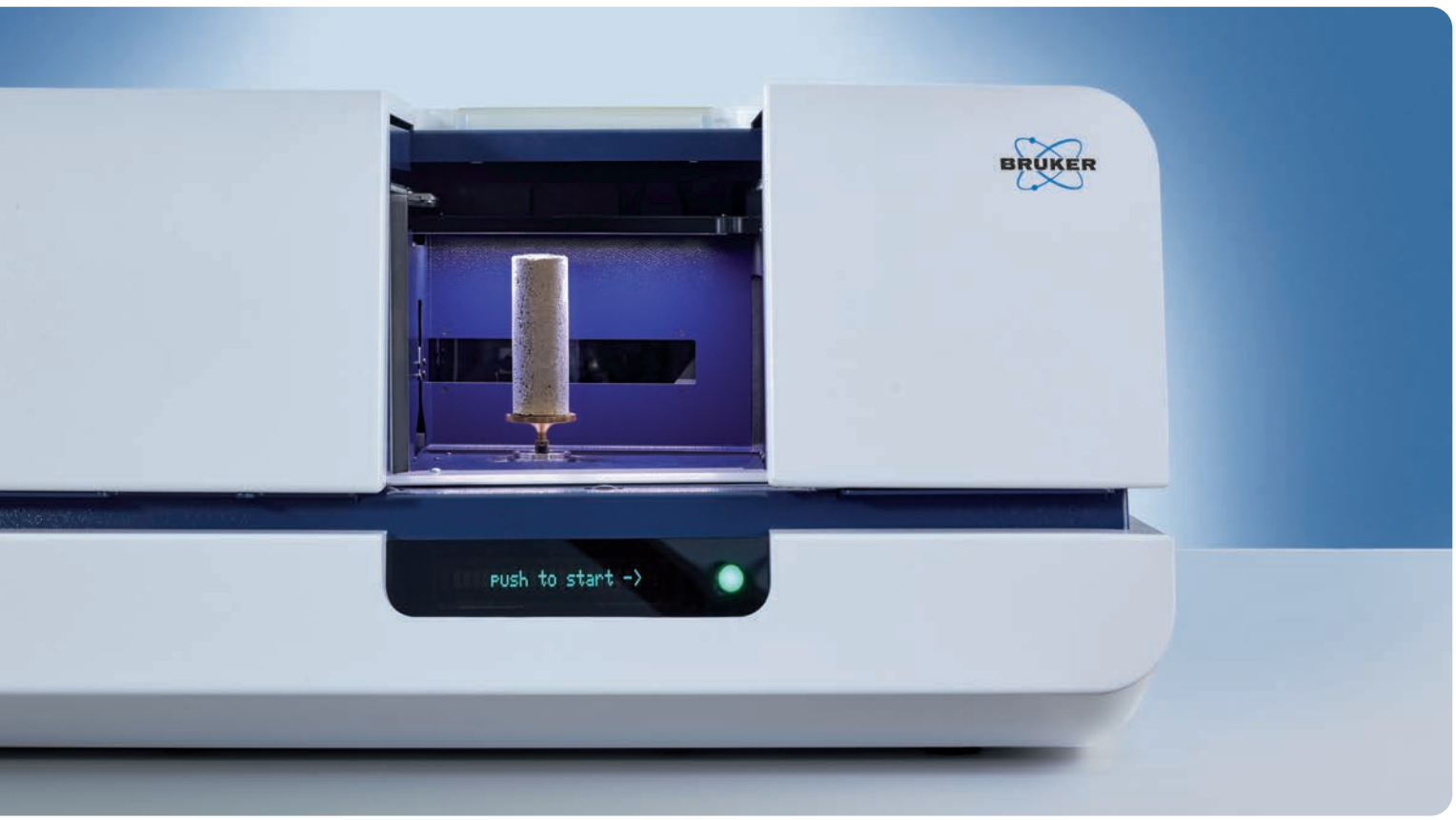
SKYSCAN 1275 with 16-position sample changer, high speed and high throughput – 24/7

Up to 16 samples with a maximum diameter of 45 mm

Up to 8 large samples (96 mm) or any random combination of large and small samples

High image quality across all sample sizes

By using geometric magnification, the SKYSCAN 1275 reaches resolutions below 4 µm on small samples, and also scans large or dense samples at high quality. The efficient flat-panel camera ensures fast acquisition of images with a very high signal-to-noise ratio. Long, oversized samples of up to 12 cm in height can be scanned in sections, which are seamlessly and automatically stitched together.

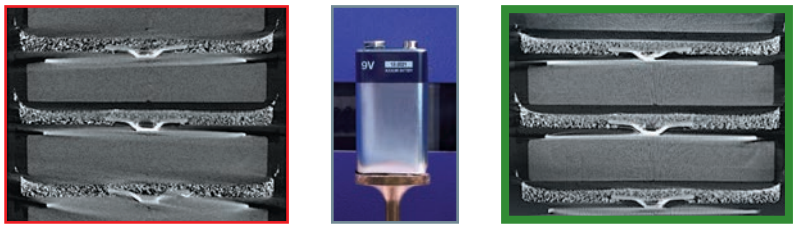


SKYSCAN 1275: samples up to 120 mm height, Ø 96 mm

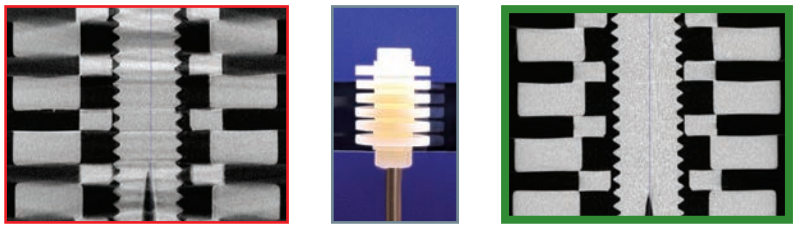
Helical scanning: distortion-free, exact reconstruction

The cone-beam geometry of X-ray microscopes can cause artefacts when reconstructing horizontal structures in a sample. The SKYSCAN 1275 prevents such artefacts through helical scanning, where the sample follows a spiral trajectory during the acquisition phase. Using helical scanning and GPU-accelerated exact reconstruction, the SKYSCAN 1275 scans and reconstructs a sample absolutely distortion free. It can also scan long samples continuously, in one single run.

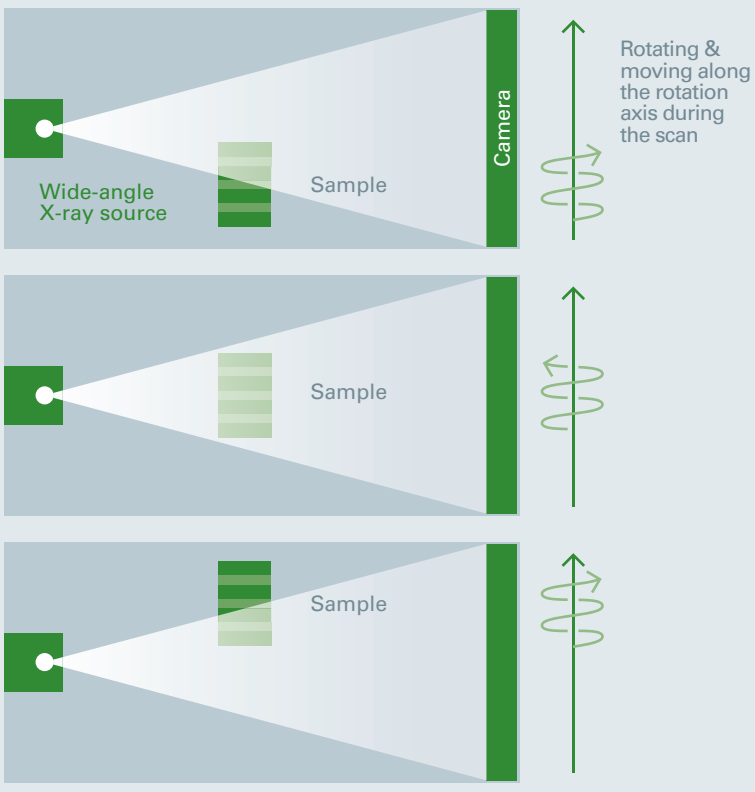
SKYSCAN 1275
When it Comes to "Better Results Due to Better Data" Every Detail Matters

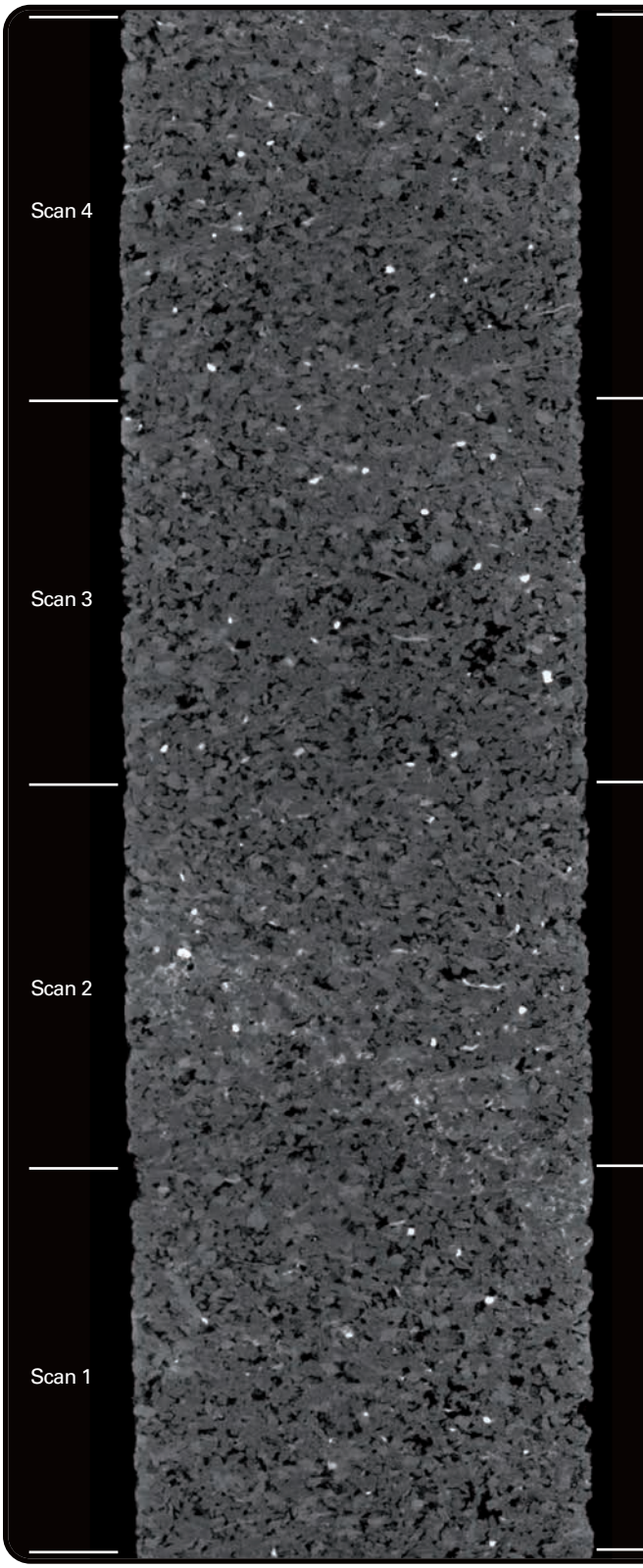


Elimination of cone-beam artefacts (left) by using helical scanning (right) in a battery



Vertical virtual slice through a reconstructed Defrise phantom using circular (left) and helical (right) trajectories





Automated stitching of multiple circular scans of a sandstone microplug
5 µm voxel size, 80 kV, 1 mm Al filter,
1,944 x 1,944 x 6,000 px – 5 mm sample diameter

Menu

- Simple, uncluttered menu for scanner control
- HELP database for additional information about features and functions

1

Toolbar

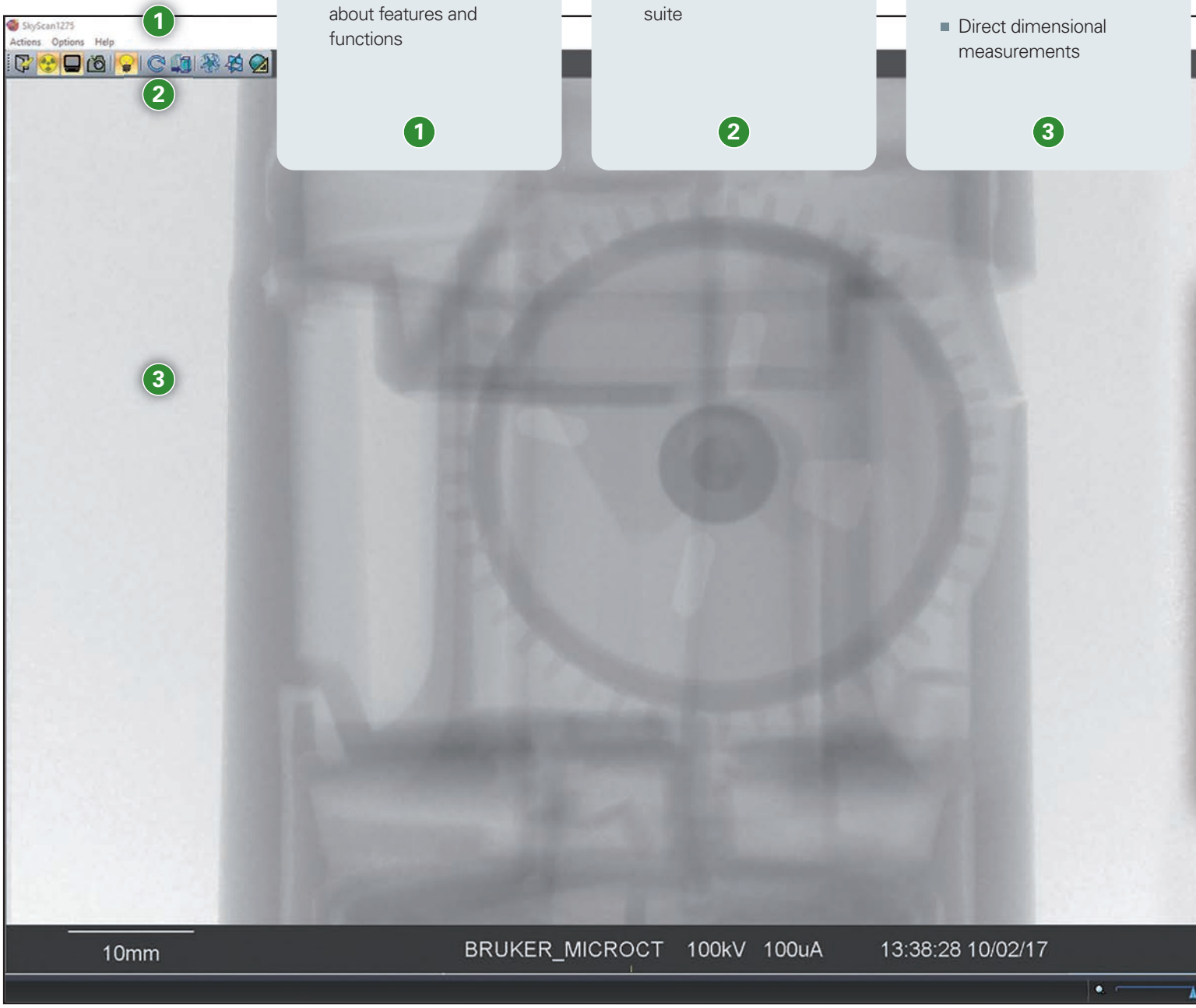
- Natural left-to-right scanning workflow using clearly labeled icons
- Quick links to entire SKYSCAN software suite

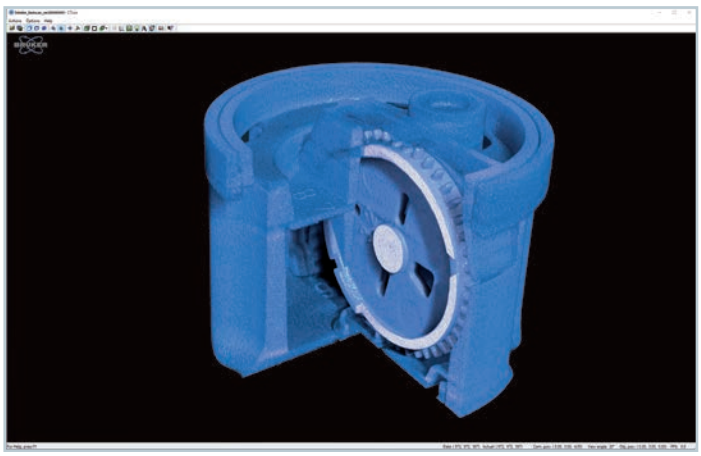
2

X-ray Image

- Live view of X-ray projection images
- Easy switching between raw and background-corrected X-ray images
- Direct dimensional measurements

3





The internal components of an inhaler scanned in just 100 seconds
40 µm pixel size, 100 kV, 1 mm Cu filter,
972 x 972 x 768 px – 38 mm sample diameter

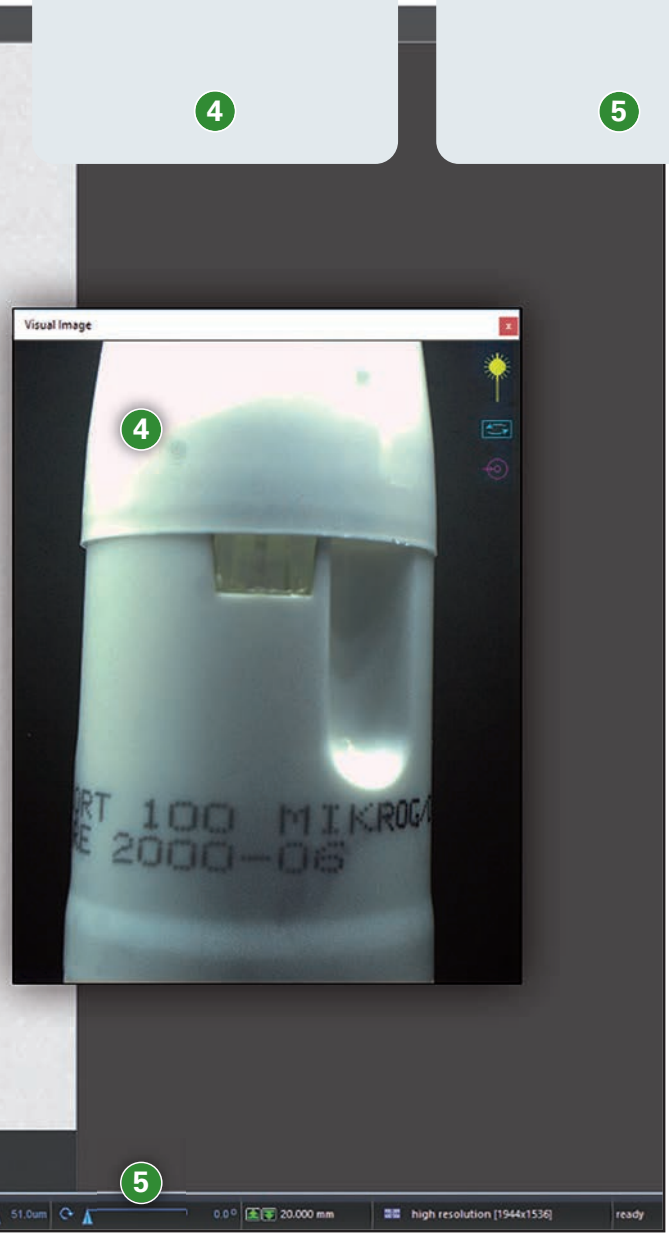
Video Image

- Sample inspection with live optical camera
- Allows positioning of the sample for the highest resolution

Control Bar

- Slider control for magnification, object position, and rotation
- Quick control of X-ray camera modes

Just start your analysis!
Video at:
www.bruker.com/
SKYSCAN1275-Video2



Overview of the SKYSCAN 1275 control software window
Inhaler, 40 µm voxel size, 100 kV, 1 mm Cu filter, 972 x 768 px

SKYSCAN 1275 Software Suite means Ease-of-Use plus Enjoy-your-Work

Control Software

Intuitive, simple, yet powerful – the SKYSCAN 1275 control software is designed to inspire finding out what's inside. The whole screen, including all menus and icons, is laid out in a straightforward, left-to-right manner that even a first-time user will find intuitive enough to start scanning right away. All major functions can be performed with a single click, allowing researchers to focus on analyzing their samples, rather than finding buttons or navigating nested menus.

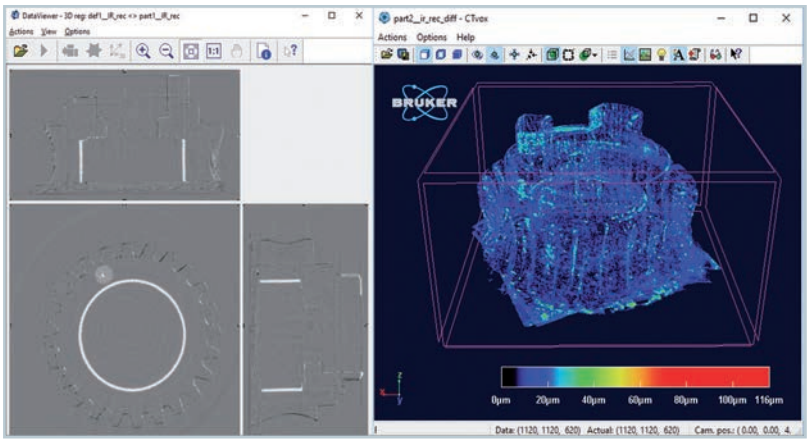
Good Laboratory Practice (GLP)

The SKYSCAN 1275 systems are supplied with a GLP module, which allows administration of user rights and implementing the necessary data protection according to GLP requirements. Three levels of access can be granted: standard users, advanced users and supervisors.

When the GLP module is activated, the control software duplicates every scan logfile, with all scan parameters and system settings, in an encrypted copy that cannot be directly accessed or modified. When necessary, encrypted logfiles can be restored to text for QA audit, to ensure the secure storage and traceability of critical scan information and allow reproduction of any scan.

Metrology

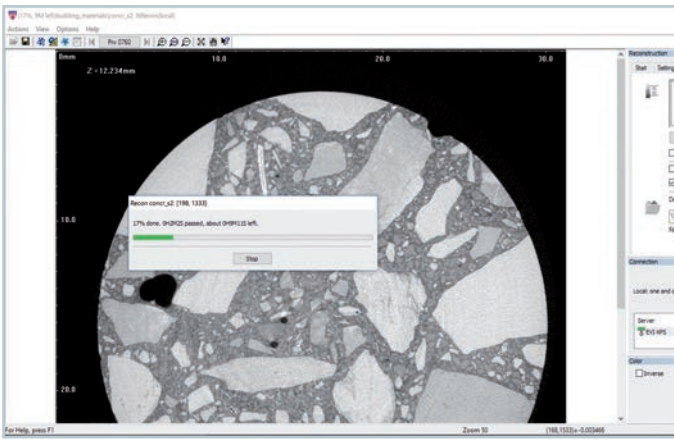
For metrology purposes, the SKYSCAN 1275 can be factory calibrated to achieve very high measurement accuracy. This enables measuring precisely internal and external dimensions. Furthermore, the reconstruced 3D structure can be compared with scanned reference or CAD data.



3D registration between a reference and a produced part (left)
and a color-coded map of measured deviations (right)

NRECON
GPU-accelerated reconstruction for round and spiral trajectories

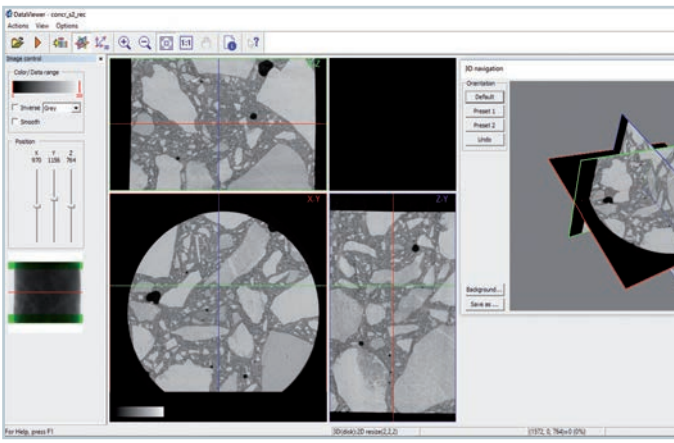
2D projection images are transformed into 3D volumes by the reconstruction software NRECON. Typical CT artefacts, such as beam hardening, ring artefacts and misalignment, are easily corrected. By using GPU acceleration, reconstruction times are up to ten times faster than traditional CPU-based reconstruction. GPU acceleration supports both conventional round CT and helical scanning.



Reconstruction of a
concrete core in NRECON

DATAVIEWER
Slice-by-slice inspection of 3D volumes and 2D/3D image registration

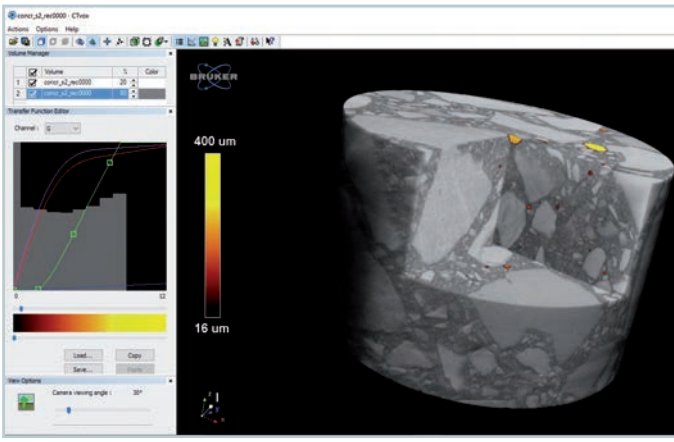
DATAVIEWER allows inspection of the reconstructed volume using orthogonal slices in any direction. Objects can be rotated, repositioned, and resliced using their new orientation for more convenient visualization and saving of more efficient subvolumes. The software includes intuitive tools for measurement of 3D distances. 2D and 3D image registration enables the exact alignment of multiple scans of the same sample, acquired at different times.



Three orthogonal slices through
a concrete core in DATAVIEWER

CTVOX
Realistic visualization by volume rendering

CTVOX is an easy-to-use volume rendering package that provides precise control of visualization parameters, ensuring a realistic representation of all types of samples. CTVOX offers intuitive manipulation of the poin-of-view, virtual slicing through objects, and full control of light, shadow, and surface properties. Creating attractive cover images and movies that impress has never been so easy.



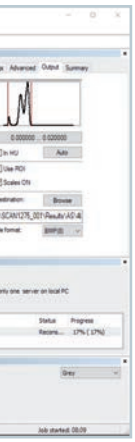
Volume rendered concrete sample
showing color-coded pore size distribution in CTVOX

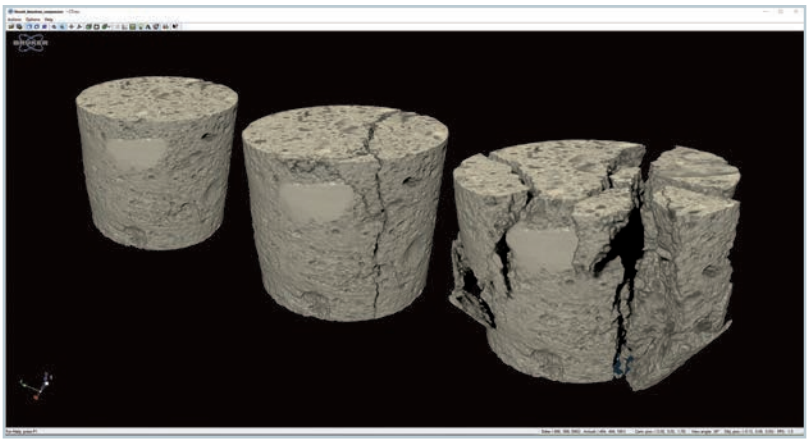
Time-resolved 4D CT

The fast scan times of the SKYSCAN 1275 make it the perfect system for time-resolved CT or 4D CT. Users can follow a sample's evolution by scanning it at different points in time. By using very fast scan times down to 80 seconds, dynamic processes can be visualized in real time and in-situ.

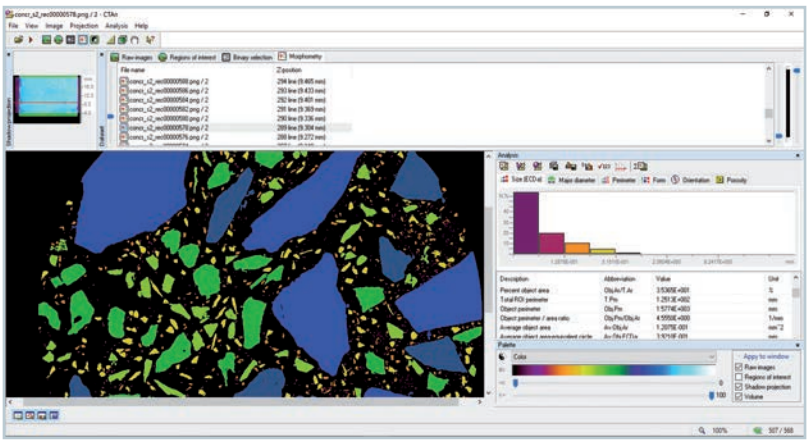
4D scan of a compression test
Video at:
www.bruker.com/SKYSCAN1275-Video3

4D visualization of salt crystallization
Video at:
www.bruker.com/SKYSCAN1275-Video4





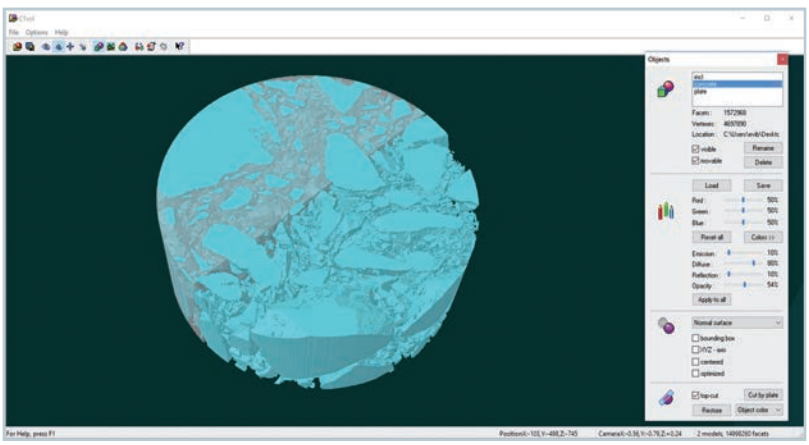
In-situ mechanical testing of a limestone plug under 0, 150 and 500 N of compression
12 µm pixel size, 100 kV, 1 mm Cu filter, 1,944 x 1,944 x 1,536 px – 10 mm sample size



Individual analysis of aggregate particles in concrete using CTAN

CTAN
2D/3D image analysis & processing

Built over two decades from direct feedback from scientists all over the world, CTAN is one of the most used programs for quantitative image analysis. This package includes an extensive number of tools for region-of-interest selection, image segmentation and 3D measurements. Using the comprehensive library of embedded plugins or user-customized protocols, quantifying complex microstructures such as porosity, thickness, orientation, and many other properties is easy. Simplify large study sets by batch analysis.



Surface rendered model of concrete binder and aggregate in CTVOL

CTVOL
Built-in surface rendering

Surface models can be visualized in CTVOL, a flexible 3D viewing environment. Volumes can be exported in several formats including STL, to allow 3D printing of the acquired scan data or further use in CAD and modelling programs.

Best Components, Superior Technology and Utmost Quality for Saving Energy, Time & Money

Maintenance-Free

No Hidden Costs, No Compressor, No Filaments

~99% Uptime

Runs 24/7 for Years and Will Never Let You Down

Low Power Consumption

Saves 21,000 kWh Electrical Energy per Year*

The SKYSCAN 1275 provides top performance with peace of mind for years and will never let you down. No hidden costs of ownership, because our X-rays are "green" and the system is future-proof. Save maintenance, energy, and time – and in the end a lot of money!

* 24 hours, 300 days

SKYSCAN 1275 with Sealed X-ray Tube

System

Yes 1

Mainten

\+ Maintenance-free

Power

Yes 1

Low CO_2

\+ 90 W

Systems with Open X-ray Tube	SKYSCAN 1275 with Sealed X-ray Tube	Systems with Open X-ray Tube

Uptime

ance-free → **No**

- Filament break during scan
- Filament replacement ½–1 hour
- Source cleaning ½–1 hour
- X-ray source maintenance 2–3 days / year
- Mechanical alignment of electron gun once / year
- Compressor maintenance once / year
- Chiller maintenance once / year
- Target replacement once / 2 years

Installation

Yes (1) ← Plug'n Analyze™ → **No**

- \+ Plug'n Analyze
- \+ Standard wall socket
- \+ Standard table
- \+ Standard door
- \+ Lightweight 170 kg
- \+ Little space
- \+ Easy transportation

- Installation 1–2 days
- High-voltage power
- Reinforced floor
- Double door
- Very heavy ~2,000 kg
- Large footprint
- Forklift needed
- Heavy-duty elevator
- Extra space compressor
- Extra space chiller

Consumption

Footprint → **No**

- > 3,000 W
- Additional room cooling

Operation

Yes (1) ← Failsafe & Foolproof → **No**

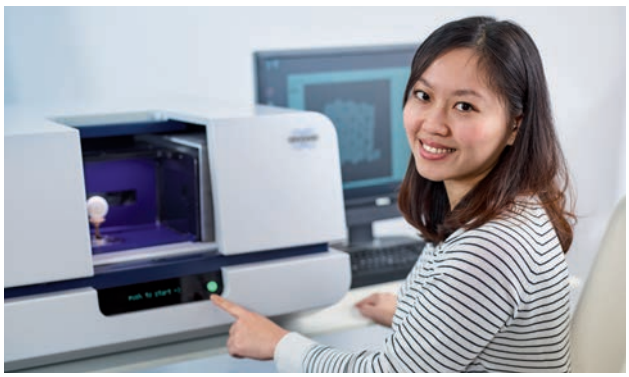
- \+ Ease-of-use, made for everyone
- \+ Sample changer outside X-ray area
- \+ No pause during sample handling
- \+ Runs automatically 24/7

- Highly skilled operators only
- Sample changer inside X-ray area
- Scan pause during sample handling
- Operator needed Mon–Fri, 9–5

Rely on the Only One-Stop Shop for XRM and Become Part of the Bruker User Family

Bruker XRM Academy for education and training

CTVOX mobile app with full functionality



SKYSCAN 1275 high-speed X-ray microscope with Push-Button-CT

Hardware

- Systems, sample stages, computers and monitors from one supplier
- Fully calibrated and extensively tested hardware
- Direct installation and support from certified service engineers

Software

- Powerful 3D analysis software and realistic 3D visualization
- Dedicated mobile app with full functionality and performance
- Multiple file formats for reporting and presentation
- Fully in-house developed software

Experts

- Direct customer support and dedicated in-house experts
- Full system and software training
- Scientific support for applications and analytical tasks
- Newsletter with method training notes

Get your CTVOX App & check out some samples!

iOS Android

Bruker employs a team of researchers, engineers and technicians to provide cutting-edge desktop and laboratory XRM systems. From hardware to software, all of our experts work closely together and with customers to provide the best solution. Welcome to the only one-stop shop for X-ray microtomography.

By relying on a SKYSCAN 1275 you become part of the Bruker user family and benefit from the exchange of knowledge and experience.

We look forward to meeting you at our next get-together.

Get linked to the Bruker XRM Academy

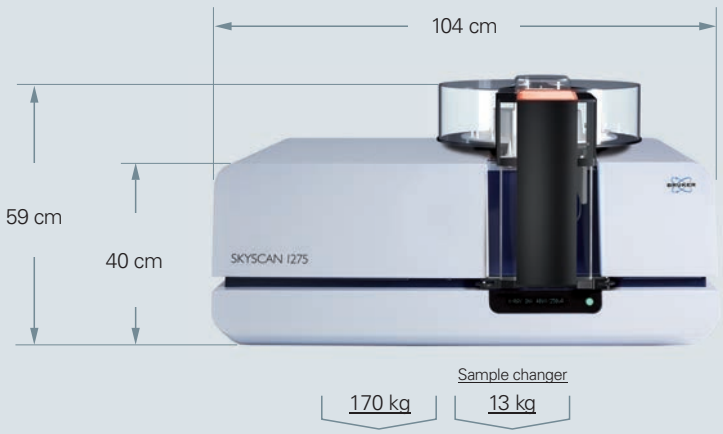
www.bruker.com/products/microtomography/academy/academy.html

XRM user meeting in Mondorf-les-Bains, Luxemburg

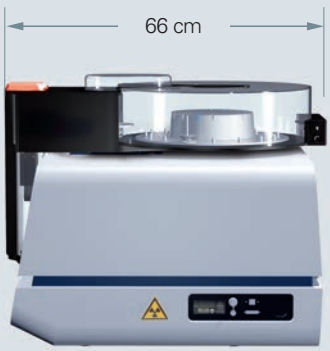
Overview of Features and Benefits

	Specification	Benefit
X-ray source	20 – 100 kV, 10 W < 5 µm spot size at 4 W	Covers a wide range of applications, from organics to metals
Nominal resolution (pixel size at maximum magnification)	< 4 µm	
X-ray camera	3 MP 1,944 x 1,536 px active pixel CMOS flat panel	High readout speed High signal-to-noise ratio
Reconstructed volume (after round trajectory scan)	up to 1,944 x 1,944 x 1,160 px	
Sample size	SKYSCAN 1275 Max. height 120 mm, max. Ø 96 mm	Allows scanning of large objects
Radiation safety	< 1 µSv/h at any point on the instrument surface	Meets international safety requirements Easy installation
Power supply	100 – 240 V / 50 – 60 Hz	Standard wall socket Plug'n Analyze™
Dimensions (W x D x H)	SKYSCAN 1275 104 cm x 66 cm x 40 cm 104 cm x 66 cm x 59 cm, with sample changer	Fits through standard doors Easy installation

Front



Right



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