Anton Paar

The Straight Path to SAXS

SAXSpoint 500

SAXSpoint 500

Pure Brilliance

Take on routine samples with the help of the best-in-class beam delivery system. Thanks to an X-ray beam with the highest spectral purity (>99.9 % Cu K_α) and scatterless beam collimation, users are guaranteed synchrotron-like data quality (including SAXS/WAXS/GISAXS) with minimum experimental effort and within the shortest exposure times. This SAXS system, with its brilliant setup and industry-leading optical system, enables the resolution of structures up to 300 nm (d-spacing), at the most compact system size (2.7 m x 0.9 m).

Flexibility for your experiments
Customize your system to tackle various samples with a wide range of stages tailored specifically for SAXS applications. Analyze almost any nanostructured material, and switch between different sample stages seamlessly with automatically aligned components. The range of stages includes the TCStage for temperature-controlled analysis and the GISAXS stage for grazing-incident analysis, amongst others.

Accelerate your processes with automation
Minimize human error when it comes to complex SAXS experiments. With all routine tasks fully automated, accelerate your measurement processes, and allow the SAXSdrive software to align all X-ray components and sample stages.

Automate your sample throughput with the low-volume autosampler for up to 192 samples, and ensure they maintain their integrity during storage with the temperature-controlled well plate compartment.

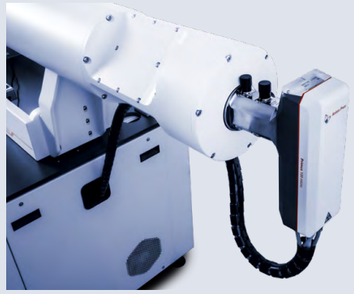
Powerful software
The intuitive SAXSdrive™ and SAXSanalysis™ software integrate automated routines like temperature scans and time-dependent studies, letting you focus on more important tasks.

Analyze your data using customizable templates, and determine parameters like radius of gyration (R_g), particle size, and specific surface. Export data to all relevant formats for further analysis. SAXSanalysis ensures that you meet industry standards and norms, such as ISO 20804.

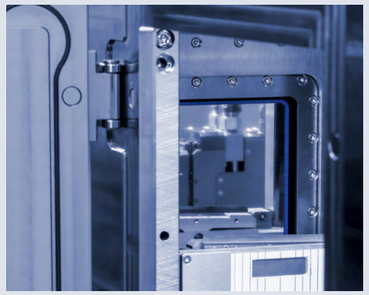
Support when you need it
Get the most back from your investment with Anton Paar's standard three-year warranty. Benefit from a global support network, guaranteeing maximum uptime. With subsidiaries across the globe, expert advice and on-site support are never far away.

FIND OUT MORE

Sources and Detectors



Powerful X-ray source
Primux 100 micro from Anton Paar
This brilliant, maintenance-free microfocus X-ray source, combined with advanced ASTIX optics by AXO Dresden, provides outstanding X-ray flux and the highest spectral purity. Primux 100 micro is available with Cu and Mo target materials (other target materials on request).



Synchrotron detector technology in a lab-scale instrument
SAXSpoint 500 comes with the latest detector technology from Dectris. It integrates the high-resolution EIGER2 R or PILATUS4 R series with hybrid photon-counting (HPC) technology. It can be operated in a windowless mode (EIGER2 only) for beamstop-less measurements.

Structural Investigations
at the Nanometer Scale

Size
Obtain the size and size distribution of your sample.

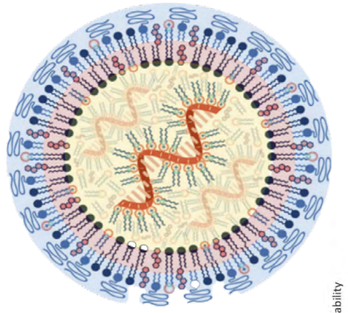
Shape
Learn about the shape of biological nanostructures, e.g. in protein research.

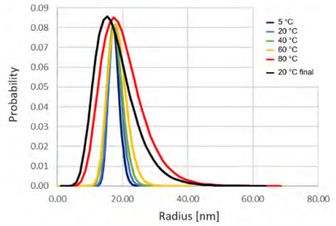
Specific surface area / porosity
Measure the specific surface area of your sample and obtain information on the porosity in a single measurement.

Orientation
Monitor changes in nanostructure orientation of your sample while applying an external force, e.g. shear.

Internal structure
Obtain information on the internal structure of, e.g., core/shell systems as in LNPs loaded with mRNA.

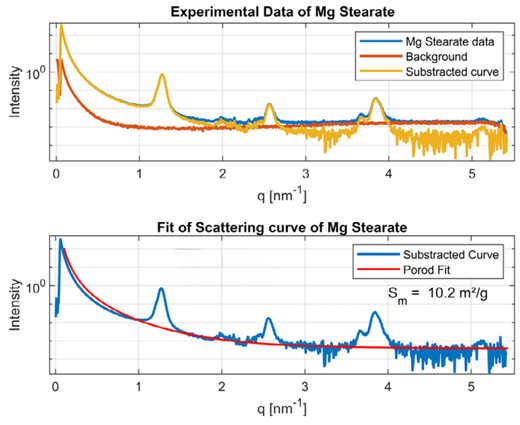
Crystallinity
Analyze the order of your nanostructure on the mesoscopic scale.





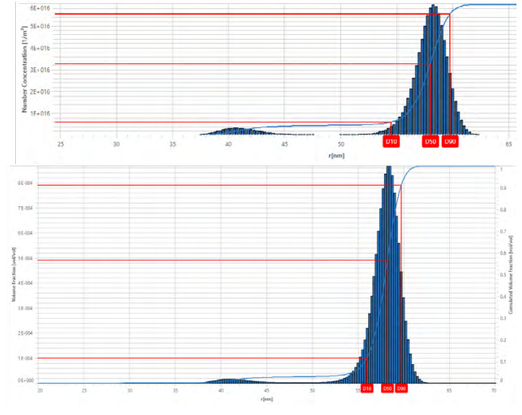
Pharma

SAXS study of mRNA-LNP vaccines[1]
Lipid nanoparticles (LNPs) are widely used as carriers for pharmaceuticals. In the case of mRNA vaccines, the LNP nanostructure (size, composition) directly impacts both efficacy and stability. SAXS enables the analysis of mRNA-LNP samples in solution, preserving their native state. For example, SAXS can be used to monitor vaccine stability under external influences (e.g., aging, pH, temperature stability) by evaluating the size distribution.



Quality Control

Assessment of the specific surface area of Mg Stearate
Mg Stearate is a sample used in the pharmaceutical industry as a lubricant in tablet and capsule manufacturing. Measurement of its specific surface area is an important QC parameter; SAXS can give very quick and highly reproducible results for this material, providing an alternative to sorption-based methods.



Material Science

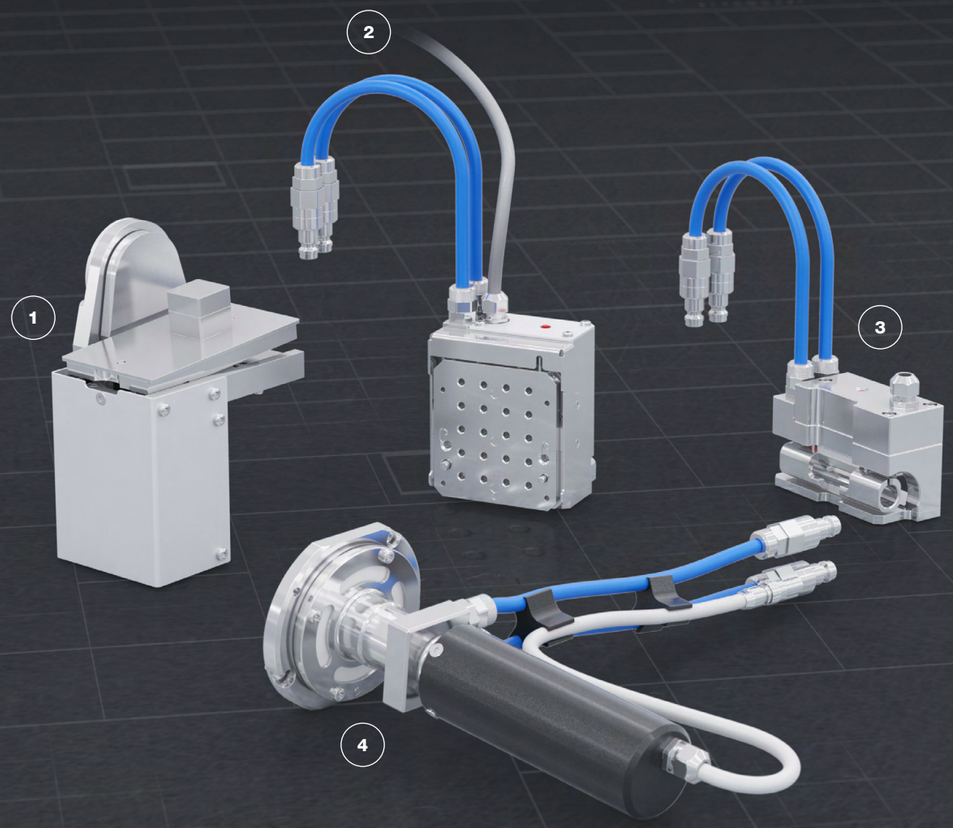
SAXS study of SiO_2 nanoparticles solution
Silicon dioxide (SiO_2) nanoparticles have a wide range of applications, including fields such as energy, biomedicine, and catalysis. Their size directly relates to efficiency and functionality, so having accurate control over both nanoparticle size and concentration is a key metric. SAXS allows measurement of both properties in a single experiment at the highest accuracy.

1 Buschmann, M.D. et al., Vaccines 2021, 9, 65

Choose Your Stages
One System for All Your Needs

High-quality, high-precision sample stages
Choose from high-quality and high-precision off-the-shelf sample stages and holders for almost every type of sample material. All stages are fully integrated in the software and hardware, automatically recognized, and configured for the setup.

Flexibility
Set up your experiment to suit your research and obtain excellent insights into your sample under ambient or non-ambient conditions. Contact us so we can design and implement customized sample environments or combinations with other instruments and complementary methods.



1. GISAXS Stage 2.0
Grazing-incidence, small and wide-angle X-ray scattering (GISAXS/GIWAXS) studies

2. Heated Sampler
Automated sampling/mapping of multiple samples

3. TCStage 150
Temperature-controlled studies of single samples

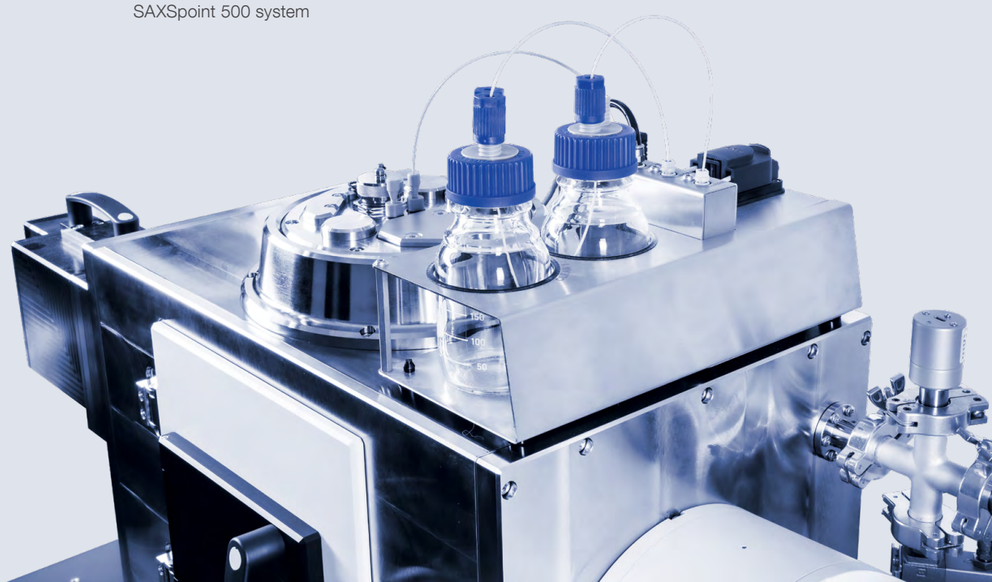
4. Shear Cell
Simple shear experiments in SAXS/WAXS

Low-Volume Autosampler

With our low-volume autosampler for liquids, speed up your workflows with the high-throughput SAXS analysis of liquid biological samples as well as nanoparticle dispersions.

- ✓ Get precise and reliable (Bio-)SAXS results of up to 192 samples and eliminate the potential for cross-contamination.
- ✓ Reduce costs by processing small sample volumes down to 5 µL and avoiding consumables.
- ✓ Program and run measurement series completely automated and unattended – monitor via remote access.
- ✓ Precisely control the sample temperature during storage and for in-situ, temperature-dependent SAXS experiments.
- ✓ Cleaning routines clean the entire fluid path of the sampling and measurement compartment effectively with up to two different cleaning liquids and dry quickly with dry air or nitrogen.
- ✓ Video camera precisely monitors the sample position during the SAXS measurement.

Sample volume	Min. 5 µL
Sample temperature control	5 °C to 70 °C
Storage temperature	5 °C to 50 °C
Cooling/heating	Peltier
Integration	Fully integrated in SAXSpoint 500 system



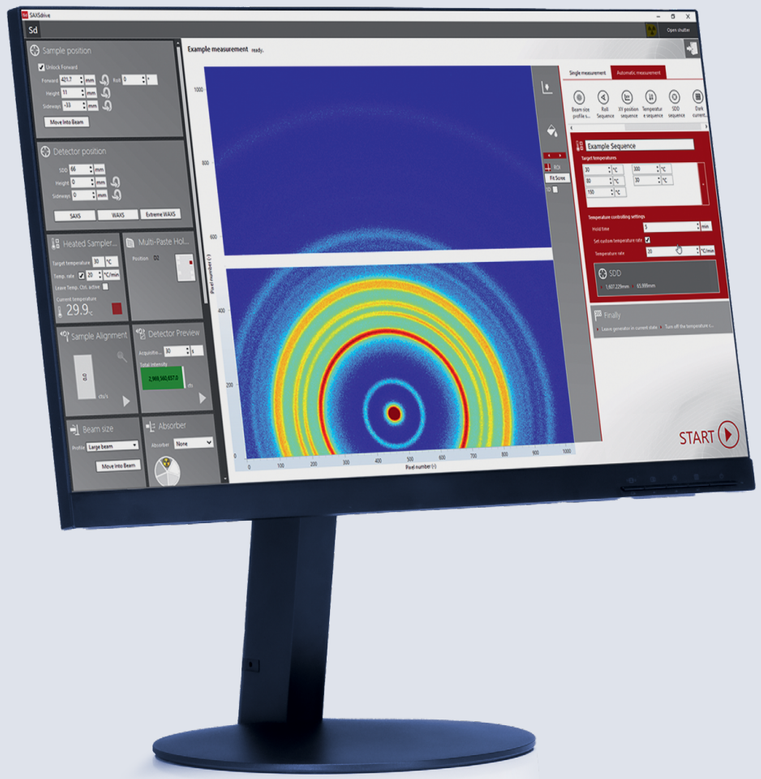
Dedicated Software
for the Best SAXS/WAXS/ GISAXS Results

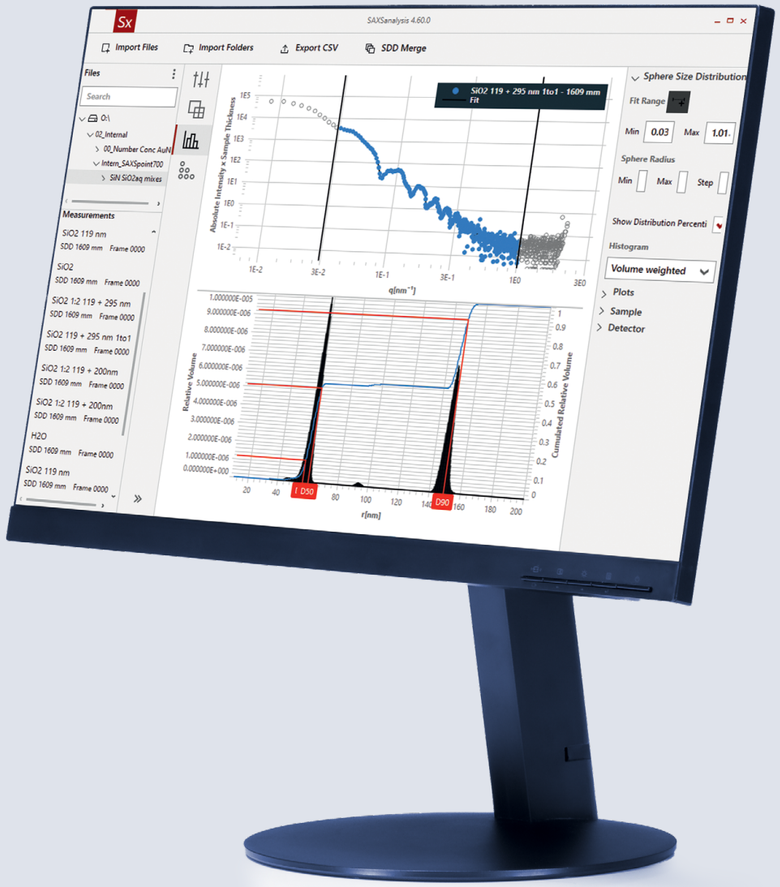
If you process and analyze a multitude of scattering data, you need optimized and powerful software packages. With the SAXSdrive™ and SAXSanalysis™ software packages, you can easily create automated serial measurements with already-included automated sampling and temperature scans. Benefit from automated data processing and evaluation possibilities.

System control and data acquisition
Use SAXSdrive™ to control all system components. It allows you to easily program and run automated SAXS/WAXS/GISAXS/RheoSAXS experiments. Design your own experiments using the Python scripting interface.

Data processing and analysis
Use SAXSanalysis™, a comprehensive data reduction and analysis package for 2D and 1D scattering data. Benefit from automatic processing to obtain your results quickly, even from a large amount of scattering data. The data layout follows the commonly used Nexus convention.

- → Receive scattering data in absolute units fully automatically without the need to measure a reference sample.
- → Determine important parameters and obtain information on the particle size / size distribution, the specific surface area, the molecular weight, and more.
- → Free yourself from manual file conversions with automatic data export routines to common model-fitting (SasView, ATSAS, McSAS, Sasfit, BornAgain, etc.) and IFT packages.



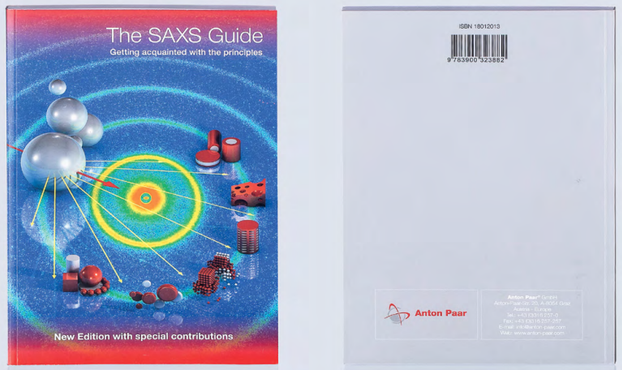


FIND OUT MORE

We Support You

We don't just sell you a SAXS instrument: Your purchase is the start of a partnership with Anton Paar which lasts for the entire lifetime of the product. Anton Paar has more than 65 years of expert knowledge in the field of SAXS. Rely on a worldwide network of application and service specialists. Our experts are here for you!

GET YOUR FREE COPY
OF OUR SAXS GUIDE



Reliable.
Compliant.
Qualified.

Our well-trained and certified technicians are ready to keep your instrument running smoothly.

FIND OUT MORE

www.anton-paar.com/service

Maximum uptime

Warranty program

Short response times

A global service network

	SAXSpoint 500 ↓
X-ray source	Primux 100 micro microfocus X-ray source (Cu, Mo; other target materials on request)
X-ray optics and collimation	- Custom-designed AXO ASTIX/ASTIX++ optics (fully evacuated) - Automated scatterless beam collimation (fully evacuated)
Sample stages and autosamplers	- TCStage temperature-controlled stages (-150 °C to +500 °C) - GISAXS stage with heating/cooling option (-150 °C to +500 °C) - Temperature-controlled autosamplers for multiple samples (-150 °C to +350 °C) - Low volume autosampler for up to 192 liquid samples, at volumes down to 5 mL - ASX autosamplers for up to 192 liquid samples - Shear cell - Customized solutions available on request
Special features	- TrueFocus: automatic self-alignment - TrueSWAXS: continuous and simultaneous SWAXS studies - Stagemaster: XYZ stage with auto-recognition of sample stages - Optional high-performance optics providing an X-ray flux of >6 x 10^8 ph/s
Temperature range	-150 °C to +500 °C
Temperature accuracy	±0.1 °C
Atmosphere	Vacuum, inert gas, (reactive gases on request)
Sample holders	- Quartz capillary for liquids - Low-parasitics SiN cell - Sample holder for solids - PasteCell for viscous and powder samples - RotorCell for sample spinning - µ-Cell for small sample volumes - FlowCell and TubeCell for automation - Holders for multiple samples - Multicuvette holder - UV-Vis cell - Customized solutions available on request: please contact us
Detectors	2D EIGER2 R and PILATUS4 R series HPC detectors
Accessible q-range	0.025 nm^{-1} to 43 nm^{-1} (no extension) <0.020 nm^{-1} to 43 nm^{-1} (with extensions)
Software	- SAXSdrive™ measurement and acquisition software - SAXSanalysis™ data processing and analysis software
Footprint	2.7 m x 0.9 m (L x W)

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