

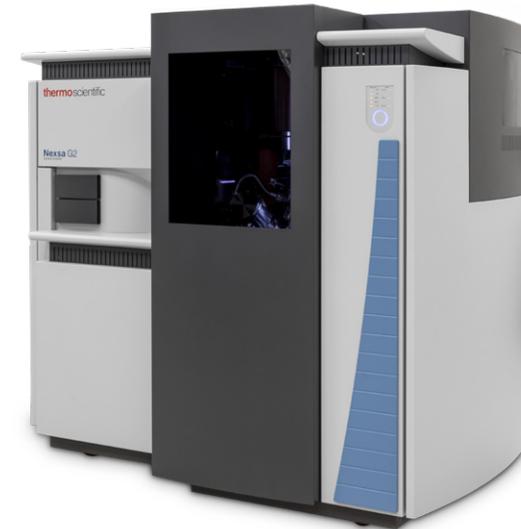


# Nexsa G2 Surface Analysis System

Fast travel to definitive surface analysis

# Definitive surface analysis

Surface and interface analysis can be challenging. It requires instrumentation that can deliver results with confidence to inform the next steps. The Thermo Scientific™ Nexsa™ G2 Surface Analysis System is a high-performance X-ray photoelectron spectrometer, designed for the integration of other analytical techniques without compromising data quality or sample throughput.



## High-performance XPS

The improved X-ray source delivers excellent sensitivity for the detection of low concentration components, and a micro-focused spot for small feature analysis

## Multi-technique integration options

- UPS: ultra-violet photoelectron spectroscopy
- REELS: reflected electron energy loss spectroscopy
- ISS: ion scattering spectroscopy
- Raman: Molecular bonding and structural information with Thermo Scientific iXR™ Raman Spectrometer

## Dual-mode ion source option

- Thermo Scientific MAGCIS™ Dual Mode Ion Source for expanded depth profiling capabilities

## Special sample options

- NX Heater for sample heating
- Multi-contact sample bias capability
- Vacuum transfer options for air-sensitive samples
- MCA Holder for SEM correlative analysis

## Applications

Batteries, Bio-surfaces, Catalysts, Ceramics, Glass coatings, Graphene, Nanomaterials, OLEDs, Metals and oxides, Polymers, Solar cells, Semiconductors, Thin films

## Standard configuration

**Monochromated Al K- $\alpha$  X-ray source** with microfocused beam, adjustable from 10-400  $\mu\text{m}$

**EX06 monatomic ion source** with ion energy range from 200 eV – 4 keV

**Dual beam flood gun** for turnkey, reliable charge compensation

**Load-lock with fast pumping and automated transfer** for fast sample loading

**Three camera viewing system** to easily find features to analyse

**Avantage Data System** for system control, data acquisition and data processing

## Upgrade options

**MAGCIS** replacing EX06 for dual mode monatomic and gas cluster ion source

**Bi-polar spectrometer** for ISS

**UV source** for UPS

**High energy flood gun mode** for REELS

**Vacuum transfer module** for air-sensitive samples

**Tilt module** for ARXPS measurements

**Sample bias module** for advanced sample biasing and work function measurements

**NX Heater** for software-controlled sample heating

**MCA Holder** for SEM correlative analysis

# Why the Nexsa G2 System?

## Fast, research-quality spectroscopy

The X-ray monochromator allows you to select an X-ray spot from 10  $\mu\text{m}$  to 400  $\mu\text{m}$  in 5  $\mu\text{m}$  steps, ensuring that the analysis area can be tuned to the feature of interest, and to maximize the signal. The improved X-ray source, high efficiency electron lens, and optimized detector allow for superb sensitivity and rapid data acquisition.

## Insulator analysis

The single-click charge compensation system on the Nexsa G2 System makes insulator analysis easy. The patented dual-beam flood source is designed to prevent sample charging, and by using very low-energy electrons, it eliminates the need for charge referencing in most cases.

## Depth profiling

The Nexsa G2 System is built to go beyond the surface with either the standard ion source or MAGCIS, the optional dual-mode monatomic and gas cluster ion source. Automated source optimization and automated gas handling ensure excellent performance and experimental reproducibility.



# XPS SnapMap

To start an analysis, you have to know where to look. The Nexsa G2 System has a unique, three-camera optical system to help you find the areas of interest quickly and align them with the analysis position.

## Bringing features into focus

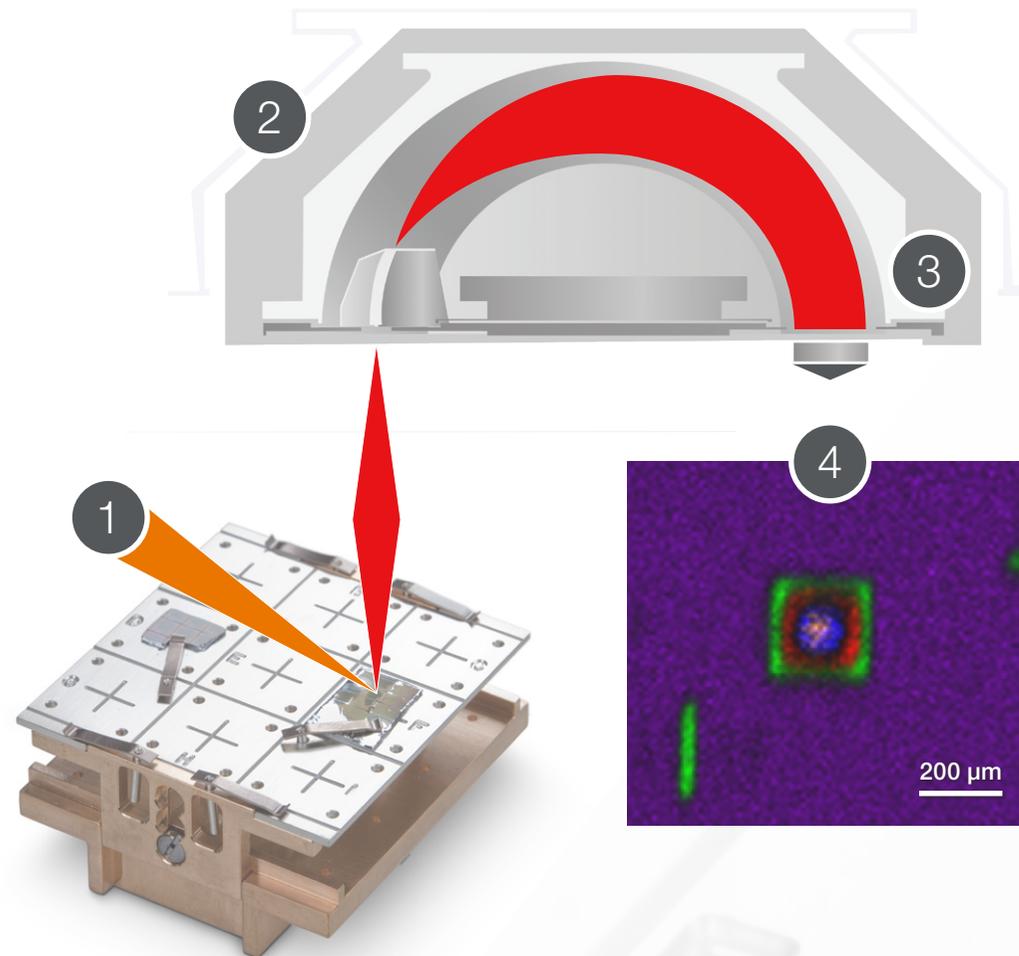
If areas of interest cannot be seen easily, XPS SnapMap can help. SnapMap rapid imaging can be used to produce a fully focused XPS image to use for defining experiments.

SnapMap can also be used for analysis. Data can be collected and processed using the Thermo Scientific™ Avantage™ Data System, which contains the tools required, including principal component analysis, to generate quantified chemical state images.

The micro-focused X-ray source and SnapMap stage raster team up to safeguard sensitivity and ensure consistent pixel size and focus across the image. In short, the Nexsa G2 System brings clarity to complex samples.

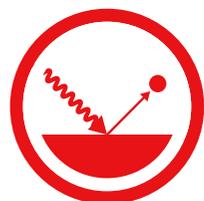
All imaging data and spectroscopy can be exported to Thermo Scientific Maps™ Software to correlate Nexsa G2 System data with electron microscopy images.

1. X-rays illuminate a small area on the sample.
2. Photoelectrons from that small area are collected and focused into the analyzer
3. Detector acquires spectra as the stage is moving
4. Spectra used to generate SnapMap



# One system for all your samples

With the Nexsa G2 System you have the techniques you need at your fingertips. The standard configuration includes everything you need for high-quality XPS. Optional upgrades transform the system into a complete analysis workstation, dedicated to solving your material analysis problems and accelerating your productivity.



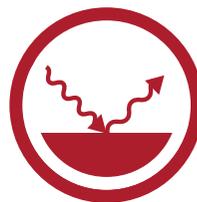
## XPS

X-ray photoelectron spectroscopy provides quantified chemical state information from the surface of the sample.



## UPS

UV photoelectron spectroscopy provides information from the valence electrons.



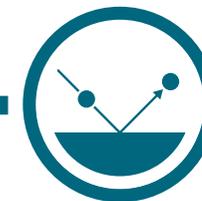
## Raman

Raman spectroscopy provides molecular bonding and structural information.



## ISS

Ion scattering spectroscopy provides elemental composition information from the top atomic layer of the surface.



## REELS

Reflected electron energy loss spectroscopy provides information on electronic structure and can measure the presence of hydrogen.

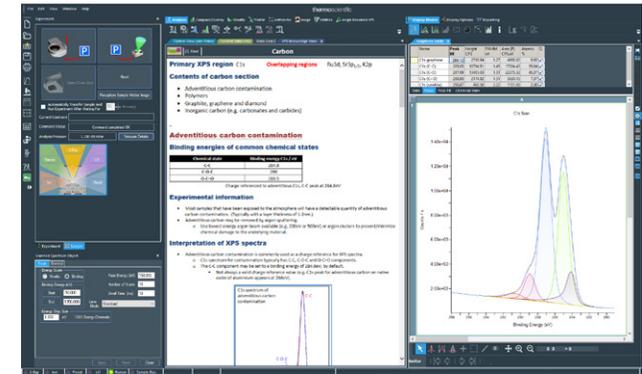


**Nexsa G2  
animation**

Duration 1:33

# Avantage Data System

The most crucial component of a modern XPS instrument is its data system. The Nexsa G2 System, like all Thermo Scientific XPS systems, uses the Avantage Data System for instrument control, data processing, and reporting. Whether you are working in a dedicated research lab or in a multi-user environment, the Avantage Data System has the flexibility, feature set, and intuitive operation to enable you to maximize your sample analysis, regardless of your level of expertise.



Avantage Software for surface analysis.

## Control

From the moment samples are loaded into the system, the Avantage Data System handles all the instrument operations to prepare for data collection. Samples are pumped down and transferred into the analysis chamber automatically.

The time to transfer samples is defined by the monitored pressure in the system, set to ensure that out-gassing samples remain in the load-lock until they are ready to analyze. The Avantage Data System monitors all system parameters, storing the data to keep a record of the performance of every system component, and can automatically calibrate the Nexsa G2 System with a single button press.

## Acquire

Data acquisition could not be simpler. Choose the analysis point, line the area from the optical view or the platen view, use the mouse-wheel to set the analysis area and match the feature of interest, define the elements of interest from the periodic table, and start the experiment.

Complex experiments can be ready to run in almost no time. Multiple positions and experiment types (point, line, area, depth profile) can be programmed into the same experiment for long, unattended runs on large sample sets. Sensible default parameters and automated analysis routines even allow the system to make decisions for you to guide you through the analysis process all the way to generating a report.

## Analyze

The Avantage Data System has a vast selection of data processing tools to help you maximize your sample analysis. From basic tools to the quantification of individual spectra, and powerful peak deconvolution routines, to sophisticated multivariate statistical analysis tools for images and depth profiles,

The Avantage Data System can meet the demands of users of all abilities. Online interactive reference guides assist with spectrum interpretation, with reference spectra and peak-fit schemes to move from data to results—fast.

## Report

The Avantage Data System offers a range of tools to output data to reports in a range of formats to suit your requirements.

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Find out more at [thermofisher.com/nexsa](https://thermofisher.com/nexsa)