

HUMAN HEALTH

ENVIRONMENTAL HEALTH

**MAXIMIZE**  
LAB EFFICIENCY WITH  
UNPARALLELED  
SPEED & STABILITY



**NexION 350 ICP-MS**

Maximum throughput. Minimum downtime. Optimum insight.



# GET MORE OUT OF YOUR ICP-MS

When your instrument is more efficient and productive, so too are your scientists and your lab. And nothing puts the flow in your workflow better than the NexION® 350 ICP-MS.

Operation is simple. Virtually any sample can be analyzed. And results are faster and more accurate for greater confidence.

Three modes of operation—Standard, Collision and Reaction—give you ultimate application flexibility and allow you to select the level of sensitivity you need without compromising speed.

## The Speed To See New Things

With a data acquisition rate 10 times faster than any other ICP-MS on the market, the NexION 350 opens up a whole new world of efficiency and opportunity:

- 100,000 data points per second
- Ideal for applications that require fast transient signal analysis, such as speciation and laser ablation
- Complete characterization of nanoparticles

In addition to the exceptional application flexibility afforded by its speed, the instrument also offers simple operation with a workflow-based software and delivers superior uptime and productivity with a variety of unique features engineered to enhance signal stability.

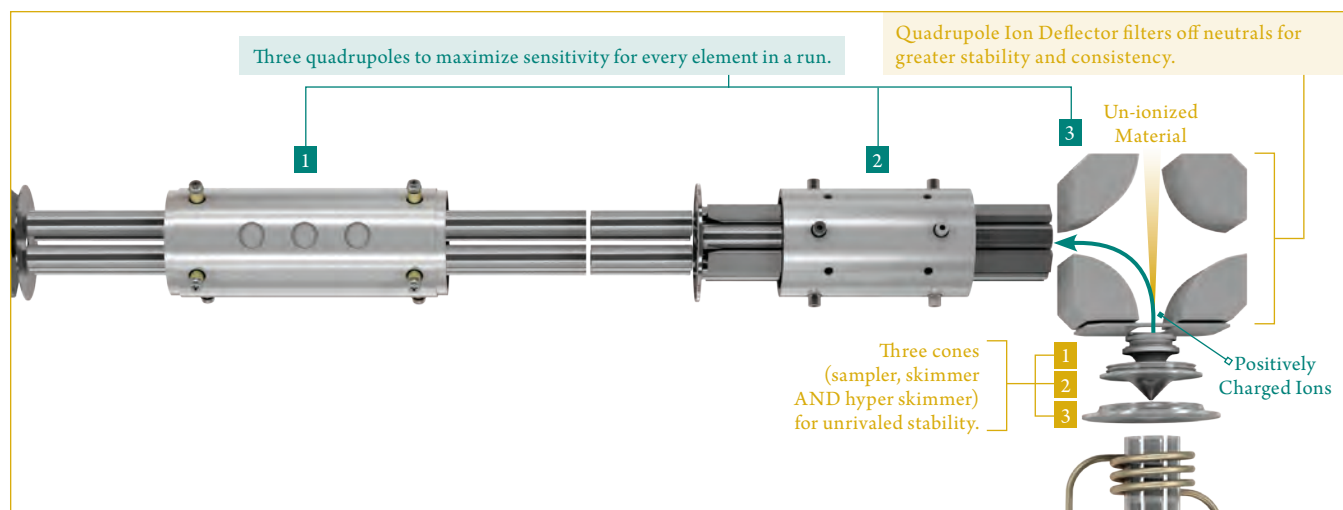
## Unrivalled Stability For Unparalleled Productivity

The NexION 350 ICP-MS is built upon the belief that scientists—and laboratories—would rather be running samples than cleaning instruments. Which is why the system includes an array of technical innovations that reduce background and interferences, optimize signal stability, minimize maintenance requirements and downtime, and generate better results.

- Triple Cone Interface produces the industry's most tightly focused ion beam and prevents sample deposition on internal components
- Quadrupole Ion Deflector turns positively charged ions 90° into the Universal Cell and filters off neutrals
- Analyzing Quadrupole made of a unique steel alloy for negligible thermal expansion
- No extraction lenses to clean for minimized maintenance

# THE PATH TO MORE CONFIDENT RESULTS

The unique ion path in the NexION 350 ICP-MS creates the cleanest, most stable environment of any instrument for more accurate and consistent results. From its robust sample introduction systems all the way through to its industry-leading detector, every component has been designed for greater flexibility, optimum performance, and superior laboratory efficiency.



## Triple Cone Interface

In addition to the sampler cone and skimmer cone typically found on other systems, the NexION 350 ICP-MS also features a unique hyper skimmer cone for the most tightly focused ion beam available.

Pressure within this unique Triple Cone Interface is reduced in smaller steps than in other instruments, providing less dispersion of ions and preventing sample deposition on internal surfaces. Voltages never need adjusting and all three cones are outside the vacuum area so they can be quickly and easily removed, cleaned and replaced to simplify maintenance and minimize downtime.



Unique Triple Cone Interface delivers both sensitivity AND stability. Easily accessible, the interface is the only component that requires cleaning so instrument maintenance is faster and simpler compared to other systems.

## Quadrupole Ion Deflector

Complementing the Triple Cone Interface to enhance stability and eliminate drift is the first of three quadrupoles in the NexION 350 ICP-MS: the Quadrupole Ion Deflector.

This breakthrough filtering feature turns the ion beam 90 degrees before it enters the patented Universal Cell and analyzing quadrupole, providing unparalleled stability, and reducing background and interferences for the most accurate results. The Quadrupole Ion Deflector is the only filter of its kind that allows you to adjust your mass bandpass on the fly, automatically, to maximize sensitivity for every element in a run.

The path through the Quadrupole Ion Deflector is aligned with the tightly defined ion beam leaving the Triple Cone Interface. This ensures ions and neutrals never impact the component's surfaces, keeping it clean for exceptional signal stability—hour after hour—even when running the most challenging matrices. The beam-focusing efficiency of the three cones and their exact alignment with the Quadrupole Ion Deflector eliminates the need for extraction lenses, further minimizing maintenance requirements and preventing elevated Background Equivalent Concentrations (BECs) for a more constant and consistent analytical environment.

The instrument is so effective at removing unionized material that it is the only ICP-MS with a cell that never needs cleaning or replacing, maximizing instrument uptime and return on investment.

# OPTIMIZE AND PERSONALIZE YOUR INTERFERENCE REMOVAL

PerkinElmer was the first company to bring together the simplicity and convenience of a collision cell and the exceptional detection limits of a true reaction cell in a single ICP-MS instrument. Not only does the NexION 350 give you the choice of these two most powerful polyatomic interference-removal techniques, it also features a Standard setting as part of its patented Universal Cell Technology™ (UCT), allowing the instrument to be run in three different modes to suit your required level of interference removal and detection limits.

## Three Modes—Complete Flexibility

With its three modes of operation, the NexION 350 ICP-MS lets you minimize analysis times without compromising your desired level of interference removal or detection limits. The instrument's Universal Cell Technology also enhances laboratory productivity by delivering the easiest, most customizable operator experience with:

- No restrictions on which gases you can use
- No compromises on how you choose to work
- No hassles switching from one mode to another (Active venting allows the system to switch between Helium and non-Helium modes in <10 seconds)

Running in Reaction mode, the NexION 350 ICP-MS offers the ultimate detection limits for difficult elements, including:

- Iron
- Arsenic
- Potassium
- Chromium
- Calcium
- Selenium
- Magnesium
- Vanadium

## The World's Most Effective, Reliable And Flexible Reaction Cell

Unlike other instruments that produce inconsistent, unreliable results in Reaction mode due to reaction byproducts in the cell, the NexION 350 ICP-MS gives you complete control over the chemistry inside the cell for absolute confidence in your data.

### Dynamic Bandpass Tuning

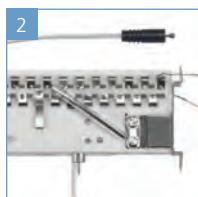
NexION's unique Dynamic Bandpass Tuning (DBT) feature efficiently screens out interferences while maximizing analyte transmission. The DBT function ejects the precursor ions before they can react to form new interferences.

### Mass Shift

For analyses in which your analyte is reactive but your interference is not, the NexION 350 ICP-MS allows you to shift the measurement of your target to a mass free from the interferent.

	STANDARD MODE	COLLISION MODE— WITH KINETIC ENERGY DISCRIMINATION (KED)	REACTION MODE— WITH A SCANNING QUADRUPOLE
DETECTION LIMITS	LOW	LOWER	LOWEST
INTERFERENCE REMOVAL	GOOD	BETTER	BEST
HOW IT WORKS	The cell gas is turned off and the system works like a non-cell instrument, providing a level of sensitivity equal to Collision or Reaction mode for elements not requiring interference correction.	A non-reactive gas is introduced into the cell to collide with interfering ions with larger diameters, reducing their kinetic energy so they may be removed through Kinetic Energy Discrimination.	A highly reactive gas (or gasses) is introduced into the cell to create predictable chemical reactions. Any side reactions and resulting new interferences are instantly removed by a scanning quadrupole so only the element of interest is passed to the analyzing quadrupole and detector.
WHY NEXION IS BETTER	A unique, actively vented cell design quickly and completely removes residual gases, allowing the NexION 350 ICP-MS to be run in true Standard mode—with the cell turned off—for optimum sensitivity. Without being able to quickly vent their cells, other ICP-MS instruments are forced to use Kinetic Energy Discrimination (KED) even in Standard mode because of potential interferences, decreasing sensitivity and limiting their operation to a single gas.	With its Extended Dynamic Range (EDR) capabilities, the NexION 350 ICP-MS allows you to selectively attenuate the signal of specific masses so you can measure elements with both low and high concentrations in the same sample in the same run—no need to use other techniques such as GFAA or ICP-OES.	Patented Dynamic Bandpass Tuning (DBT) removes all masses within a range of 20 amu—on both the low end (RPq) and high end (RPa)—eliminating the possibility of reactions and the formation of new products. Ions outside the boundaries of your defined stability region are unstable in the quadrupole and are ejected from the cell, enabling the use of reactive gases such as ammonia, oxygen and methane for superior, more targeted interference removal.
IDEAL USES	Routine applications requiring high throughput that have few interferences, making it popular in geochemical laboratories.	Applications that may be susceptible to interferences, or analyses where you simply want to remove any unknown interferences. Simple yet effective, Collision mode is commonly used for semi-quantitative analysis, environmental testing, as well as the testing of unknown samples.	Applications demanding the very best performance and an unprecedented level of interference removal. Ideal for industries ranging from semiconductor to biomonitoring and renewable energy.

# ENHANCING EFFICIENCY FROM THE INSIDE OUT



**2 Simultaneous dual mode detector**—Provides over 10 orders of dynamic range and measures both high- and low-level analytes simultaneously. Also delivers the fastest data acquisition rates of any ICP-MS instrument (100,000 data points per second to keep up with the scan speed of the analyzing quadrupole), making the NexION 350 ideal for the nanomaterials field.

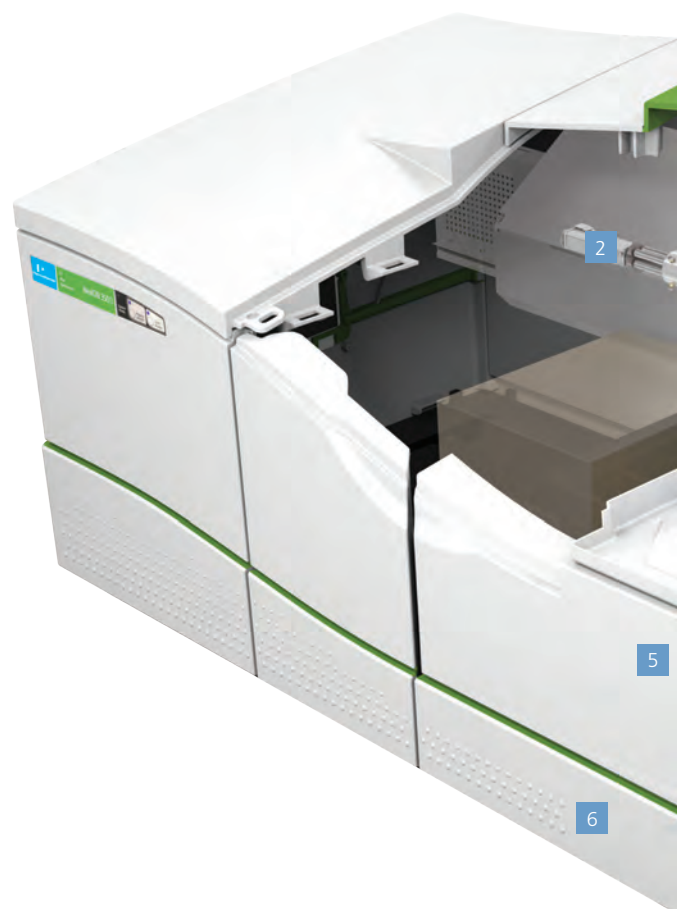
**3 Large, open, easily accessible sample introduction area**—Accommodates a wide variety of sample introduction systems that can be quickly and easily switched out to suit a particular application or matrix:

- Laser ablation for solid samples
- Liquid, gas, and ion chromatography for speciation analysis
- Peltier cooled organic sample introduction system
- Glass or quartz cyclonic sample introduction systems

**4 Low liquid uptake nebulizer**—Saves money by reducing sample consumption and minimizing lab waste. Every NexION 350 ships with a concentric nebulizer and cyclonic spray chamber and can be user-defined for specific applications.

**5 Free-running RF plasma generator**—Unlike other systems, the NexION 350's RF generator features no moving parts for reliable, robust performance, and instantly changes to accommodate any plasma—ideal for petrochemical applications and speciation solvents.

**1 Analyzing Quadrupole**—Offers the highest analytical mass range available (all the way up to 285 amu) and exceptionally fast scanning for rapid peak hopping.



**6 Benchtop design with no rear connections**—Saves valuable laboratory space and allows operation and installation up against a wall.

## Pioneered By PerkinElmer. Adopted By The Industry.

With a long history in ICP-MS, PerkinElmer has been at the forefront of industry innovation with breakthroughs ranging from the free-running generator to Dynamic Reaction Cell™ technology, Universal Cell Technology to the fastest data acquisition rates for true Single Particle ICP-MS.

**12 Universal Cell Technology**—Offers three modes of operation (Standard, Collision or Reaction) depending on the level of performance required. Switching modes is quick and easy so users can select their required level of performance without compromising speed.

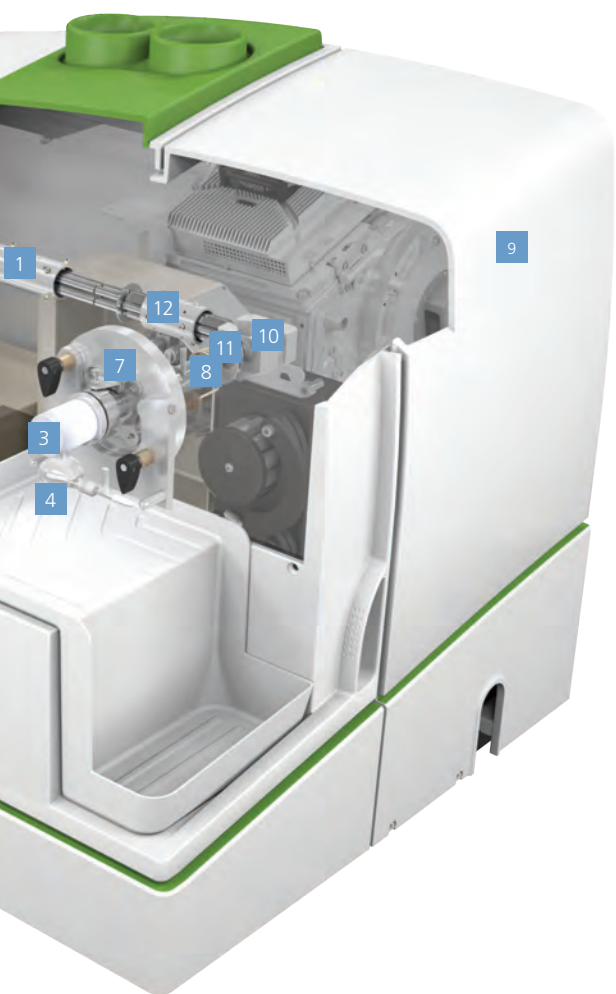
**11 Triple Cone Interface**—Produces the most tightly focused ion beam in the industry, reducing build-up on internal components (particularly the Quadrupole Ion Deflector) so maintenance and cleaning are virtually eliminated.

**10 Quadrupole Ion Deflector**—Allows only ions of a specified mass range to pass into the Universal Cell, enhancing sensitivity while keeping the cell clean—making it the only ICP-MS on the market with a cell that never needs cleaning or replacing.

**9 Custom-designed, four-stage vacuum system**—Features the highest capacity turbo and roughing pumps and allows the use of any collision or reaction gas in the Universal Cell. Pump down can be achieved in a fraction of the time of other systems, allowing users to get back to running samples 2-3 times faster than with other ICP-MS instruments.

**8 Full color plasma view**—Allows the visual inspection of the cones, torch and load coil without opening the instrument. Enables the easy optimization of plasma sampling depth and simplifies analysis of organics.

**7 Fully automated X, Y, Z torch positioning**—Computer-controlled for maximum ion transmission. Offers automatic one-touch optimization which, when combined with PerkinElmer's patented PlasmaLok™ technology (for secondary discharges), completely eliminates the need for costly consumable parts (like shields) required on other instruments.

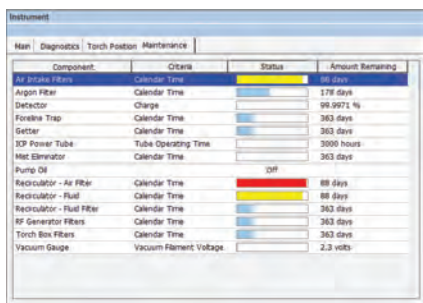


# SOFTWARE DESIGNED AROUND THE WAY YOU WORK

With a simple, clear, intuitive interface that mirrors your workflow, Syngistix™ for ICP-MS Software simplifies every interaction with the NexION 350 ICP-MS.

The left-to-right, icon-based design offers easy navigation, walking you through every step of an analysis: starting the instrument, optimizing the system, creating methods and sample lists, performing the run, and reviewing results. So no matter what your analysis type—qualitative, semi-quantitative, quantitative or specialized (isotope-ratio, isotope-dilution)—Syngistix for ICP-MS Software offers all the tools to help you generate faster, more actionable information. Pre-set methods and application-specific templates are also available to simplify and accelerate many of today's most commonly performed analyses.

For those who prefer a more traditional window-based design, Syngistix for ICP-MS Software also offers a Classic view so you can leverage the capabilities of the latest instrumentation while working in a familiar software environment.



Component	Criteria	Status	Amount Remaining
Air Purifier (A-1)	Calendar Time	OK	99 days
Argon Filter	Calendar Time	OK	178 days
Detector	Charge	OK	99.9971 %
Foreline Trap	Calendar Time	OK	363 days
Getter	Calendar Time	OK	363 days
RF Power Tube	Tube Operating Time	OK	3000 hours
Net Eliminator	Calendar Time	OK	363 days
Pump Oil		OFF	
Recirculator - Ar Filter	Calendar Time	OK	88 days
Recirculator - Fluid	Calendar Time	OK	88 days
Recirculator - Fluid Filter	Calendar Time	OK	363 days
RF Generator Filters	Calendar Time	OK	363 days
Torch Box Filters	Calendar Time	OK	363 days
Vacuum Gauge	Vacuum Filament Voltage	OK	2.3 volts

The maintenance tab in the instrument window allows you to set up and customize alerts.

## Routine Maintenance Alerts

To keep the instrument running at peak performance, alarms may be set to remind you when it's time for simple preventative maintenance tasks, such as oil changes and tubing replacement. The system will even display how many hours of use you have received to date from various components and when they may need attention. One alert you will never see is for routine cleaning of the cell—something not required with the advanced design of the NexION 350 ICP-MS.

## Simple Method Development

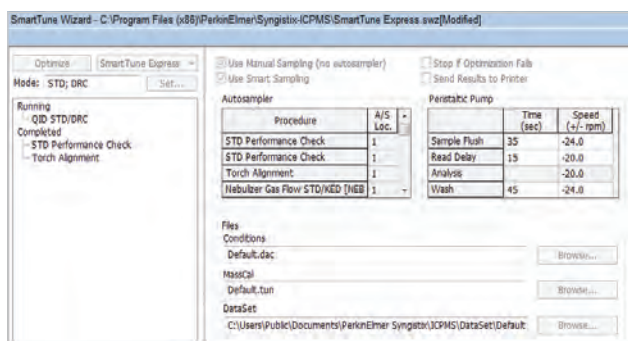
Method development has never been easier than with the NexION 350 ICP-MS. Simply select the elements you need to measure and the software will help you pick the appropriate mass based on abundance and potential interferences. Pre-set methods eliminate the need for method development in many environmental and biomonitoring applications.

Syngistix for ICP-MS Software also features TotalQuant™, a useful tool for quickly estimating the concentration of all elements in a sample simultaneously.



## Flexible Quality Control Checks

Monitoring calibration, checking standard responses and taking action to correct any problems with an analysis can all be done using the software's automated quality control checking feature. Flexible and customizable, it ensures good quality data even when the instrument is being run unattended.



With SmartTune Express, all system specifications are checked and optimized before a run, eliminating inefficiencies like torch alignment failures and ensuring more accurate results.

## SmartTune Express

Designed for maximum productivity and effortless operation, SmartTune™ Express automatically sets up all your tuning procedures and specs before a run, initiating the analysis if all parameters are met, or performing a system optimization if not. Programmed with a series of customized and specialized algorithms, SmartTune Express ensures you're not only up and running faster but are also generating robust, reliable data.

## Scheduler

By allowing labs to automatically schedule instrument optimizations and procedures—including auto-start and shut down, warm-ups, instrument tuning and analysis of samples using multiple methods—the Scheduler feature increases workflow efficiency, while reducing operator intervention for improved data reliability.

## Reporter™ Function

Syngistix for ICP-MS Software features a unique calibration reporting function that lets you see real-time updates of detection limits and background equivalent concentrations during a run. The software displays single or multi-view calibrations, giving you the information you need to make faster decisions and generate more reliable data.

## Logbook

This convenient software feature lets you review your complete instrument performance history in a single panel, displaying previous optimization data and changes made to conditions. Using Logbook, you can quickly check parameters used on a specific day and have a constant resource against which to correlate everything from sensitivity to results, and to track current comparative performance data in real time.

## Review Files

A convenient dialog box that displays all the files in your workspace, allowing you to see everything at a glance—from your method and sample list to your optimized files—before the start of a run.

## Application-Specific Environments

To further tailor the NexION 350 ICP-MS to your specific workflow, Syngistix for ICP-MS Software features a series of application-specific plug-ins and integration with a variety of external software packages to simplify everything from nanoparticle analysis to speciation.

## Speciation Analysis—For The Most Accurate Elemental Separation And Detection

The NexION 350 ICP-MS is easily integrated with our Altus™ liquid chromatography (LC), Clarus® gas chromatography (GC) or even some third-party ion chromatography (IC) systems for a complete solution for the separation and determination of individual metal compounds. Coupled with—and seamlessly controlled by—Waters® Empower® 3 software, these integrated systems deliver the simplest, most streamlined operator experience while providing the most flexible and accurate speciation analysis available.

# FAST, ACCURATE NANOPARTICLE CHARACTERIZATION

The emerging and rapidly growing field of nanotechnology has two application areas, both of which can benefit from the unique capabilities of the NexION 350 ICP-MS.

## Nanoparticle Detection

With the increased use of nanotechnology in consumer products, industrial applications and healthcare technology, nanoparticles are becoming ever more prevalent in the environment and it is becoming increasingly important to assess their fate, transformation and transportation in different matrices, whether soils, potable water and wastewater, and their resulting impact on the food supply.

## Nanomaterial Research

Because they can exhibit everything from greater physical strength to enhanced magnetic properties compared to their bulk namesakes, engineered nanomaterials (ENMs) are attracting significant attention in the R&D arena. This is leading to an increasing need to monitor their lifecycle, from creation through recycling or safe disposal.

## Unique Challenges Require Unique Solutions

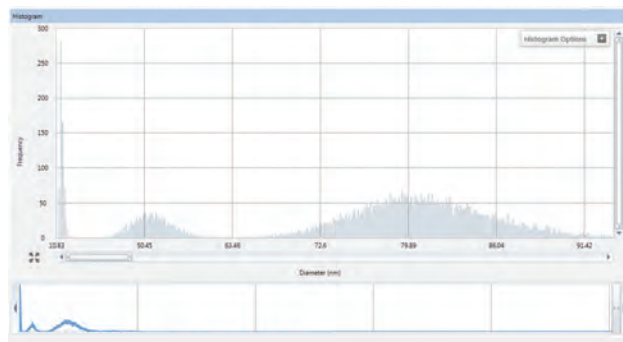
To effectively characterize nanoparticles, researchers need to determine their inorganic composition, concentration, size, surface charge, structure, agglomeration and size distribution. ICP-MS is proving to be an invaluable tool to help overcome these challenges, delivering the specificity, resolution and sensitivity required to deliver fast, accurate results.

The NexION 350 ICP-MS takes it a step further, offering the flexibility and capability of true Single Particle ICP-MS. By combining the world's fastest scanning speed and data acquisition with a proprietary software-based algorithm, the NexION 350 ICP-MS is the only instrument capable of completely characterizing your sample—and differentiating between dissolved and particulate (key for toxicology) content—in less than a minute.

## Specialized Software—Simplified Screening

Syngistix for ICP-MS Software features an optional Nano Application Module, the industry's first dedicated application for nanoparticle analysis.

This specialized software combines real-time single particle acquisition with fast data processing for routine analyses, delivering unparalleled speed, flexibility, automation and ease-of-use. Everything from particle composition and concentration to size and size distribution can be determined in a single run in less than one minute without the need for subsequent labor-intensive data processing.



The Syngistix Nano Application Module displays data in real time as it is being acquired, allowing individual nanoparticle events to be viewed as the intensity histogram builds.

# CREATE YOUR IDEAL ICP-MS SYSTEM

## NEXION 350 ICP-MS AVAILABLE CONFIGURATIONS

MODEL #	OVERVIEW	SUITED APPLICATIONS
350Q	No Universal Cell	Simple analyses requiring no interference-removing correction capabilities, including routine geochemical analysis
350X	Single-channel Universal Cell (1 gas line) or Dual-channel Universal Cell (2 gas lines, not ammonia)	General purpose, particularly environmental
350D	Dual-channel Universal Cell (2 gas lines)	Analyses requiring availability of KED and/or scanning quadrupole at all times, particularly biomonitoring
350S	Dual-channel Universal Cell (2 gas lines) optimized for sensitivity	Designed specifically for the semiconductor industry

PerkinElmer offers a wide selection of consumables, supplies, application packs and compatible systems designed and tested to enhance the performance, productivity and reliability of every NexION 350 ICP-MS instrument.

From sample digestion ovens to autosamplers, automated FIAS systems to a complete array of consumables (including cones, torches, nebulizers and standards), we have everything you need to get the most out of your instrument, your analyses, and your lab.



### Data Transfer And Analysis Made Easy

With labs being under pressure to analyze many inorganic samples in shorter amounts of time and with fewer people, the ability for software to automate the transfer and analysis of the data is of great importance. For transferring data, LimsLink™ for Inorganic software greatly reduces the time and complexity in transferring NexION data to your PerkinElmer or other manufacturer's LIMS system. LimsLink automates the process, allowing data to be automatically transferred at the end of a run. For data analysis, TIBCO Spotfire® software for Inorganic allows analysis and visualization of results directly from a system rather than time-consuming manipulation and then analyzing. Furthermore, TIBCO Spotfire software allows for advanced visualizations such as heat maps or geographical representations to be generated very easily and, once created, can be easily updated once new data becomes available.



- Business intelligence solutions
- Scientific & laboratory IT services
- Instrument service & repair
- Qualification & validation
- Method development services
- Asset procurement & disposition
- Relocation services

### Expand Your Expectations Of A Lab Services Provider

Optimize your NexION 350 ICP-MS with our comprehensive suite of services from PerkinElmer OneSource. From instrument service and repair to analytics and optimized scientific workflows, OneSource provides all the tools you need to increase your lab efficiencies and get more out of your ICP-MS. Far beyond the traditional model of a laboratory services company, OneSource becomes an integral part of your business, providing a high level of technical support and scientific expertise. Expect more from your laboratory services provider and discover our comprehensive set of tools to help empower your science and drive your business.

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