# REINVENTING THE ROUTINE

NexION 1100 ICP-MS

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# The ICP-MS That Makes the Everyday Extraordinary

Today's busiest, highest throughput environmental-, pharmaceutical-, and food-testing labs spend a good deal of their efforts and resources running routine trace elemental analyses that rely on everyday applications. And many of the technicians running these well-defined methods are novice users who could benefit from more simple, straightforward instrumentation. But regardless of application and user skill level, these industries demand accuracy and repeatability from their results – no excuses.

Our **NexION® 1100 quadrupole ICP-MS** delivers on all these requirements.

It's unbeatable in terms of efficiency and accuracy: the system provides a single gas channel for both Collision and Reaction modes, delivering a universal solution for most elements. Sample throughput is exceptional, too, with analysis time as low as 55 seconds per sample for 56 elements. And as with all our NexION instruments, this system delivers leading interference removal and matrix tolerance, for accurate, repeatable results.

Less-seasoned and expert scientists alike will also appreciate the software's modern workflow-like user experience, and which now features the FastQuant™ Data Viewer, delivering novel review, processing, and reporting capabilities; convenient LCD touchscreen; unique LED status lighting; and a clear upgrade path from one to three gas channels when the time is right.

Bottom line, the NexION 1100 ICP-MS offers the combination of efficient interference removal and high throughput with a modernized workflow and the lowest maintenance in the industry. And that means it's a robust, cost-efficient solution for the everyday applications you rely on most.




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# Boosting Efficiency, Optimizing Operations

Given the throughput needs of today's laboratories, only the most efficient instrumentation will do. That's the thinking behind the NexION 1100 ICP-MS.

First, the system uses **a single channel that allows all modes** which provides a universal solution for most elements you encounter. This channel leverages helium only for Collision mode, or pure reaction gases such as ammonia, oxygen, or methane for Reaction mode. And it can accommodate a helium-hydrogen gas mix in both Collision and Reaction modes, so you can use both modes without changing gas as you switch between them for even greater efficiencies.

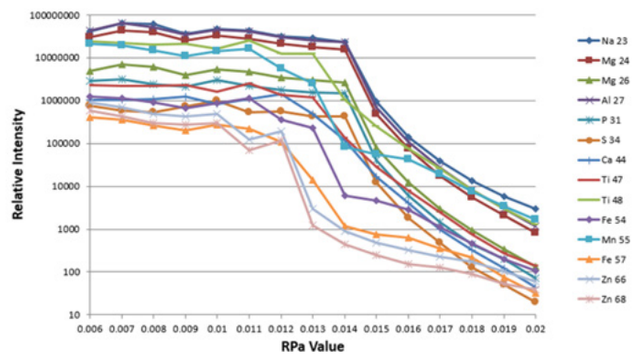
Its optional **High Throughput System (HTS)** flow-injection module reduces the time it takes for sample-uptake, stabilization, and washout procedures, for a more than 50% increase in sample-to-sample throughput, with no accompanying increase in complexity.

The NexION 1100 system's **Extended Dynamic Range (EDR)** capability leverages the proprietary quadrupole Universal Cell to electronically attenuate the signal of user-selected masses, which increases linear dynamic range by 14 orders of magnitude, for analysis of high and low concentrations in one run, so fewer reruns. And with the **All Matrix Solution (AMS)** online gas dilution at sample introduction, you can analyze difficult matrices without diluting manually. This means less time spent on sample prep and fewer deposits on the cones, for maximum uptime. What's more, the quadrupole Universal Cell enhances gas efficiency, enabling you to toggle in and out of Collision mode in seconds.

**Video:** Explore the benefits of Extended Dynamic Range

The NexION 1100 system is the lowest maintenance ICP-MS on the market – and that translates into unsurpassed uptime. Our balanced, free-running **RF generator** can always produce a robust plasma. The maintenance-free **LumiCoil™ load coil** requires no water or gas cooling and is guaranteed for life. And unlike other commercial ICP-MS systems, our unique combination of the **Triple Cone Interface** and **Quadrupole Ion Deflector** focuses and controls the ion beam in the downstream ion optics, so there's no cleaning or replacing the Universal Cell – and no breaking the vacuum seal.

**EDR Increases the linear dynamic range from 10 to 14 orders of magnitude**



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# Interference Removal to Unleash Your Science

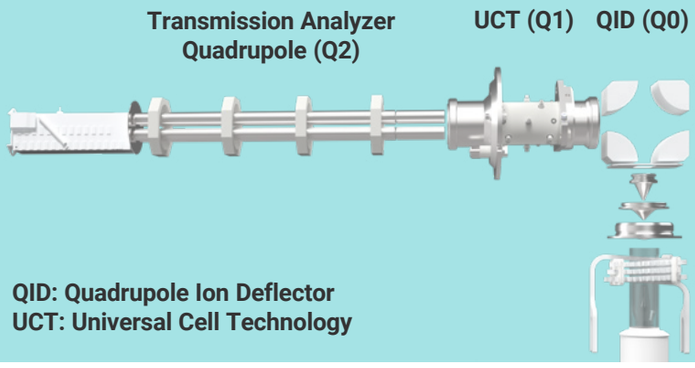


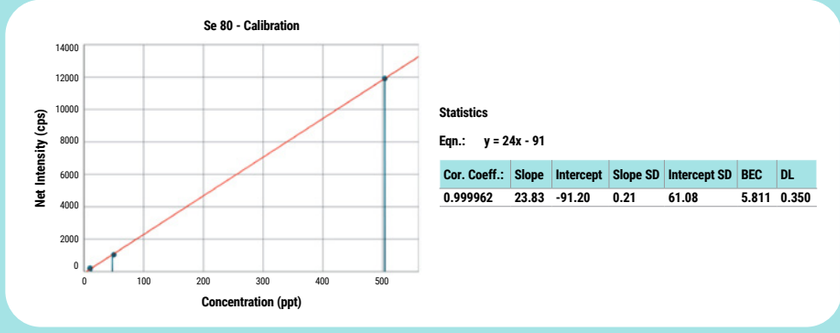
Managing interferences is key to lowering background equivalent concentrations (BECs), and the NexION 1100 system's unique single analyzer with three-quad design – featuring the **Quadrupole Ion Deflector (Q0)**, the **Universal Cell (Q1)**, and the **Transmission Analyzer Quadrupole (Q2)** – enables it to surpass conventional single-quadrupole ICP-MS technology for removing interferences, delivering parts-per-quadrillion (ppq) detection limits.

Interference removal starts as early as Q0, the first of the three quadrupoles, where the ion beam is shaped and directed and photons and neutrals are eliminated. What's more, the Quadrupole Ion Deflector reduces ions outside the mass range of interest.

The ion beam is passed into the quadrupole Universal Cell, a one-of-a-kind quadrupole Reaction and Collision cell. Collision mode (helium only, or helium-hydrogen gas mix) provides adequate detection limits with reproducible results for most applications, whereas Reaction mode, with helium-hydrogen mixed gas or pure reactive gases such as ammonia, methane and oxygen, allows controlled reactions, delivering lower BECs, for repeatable, reliable results. And with helium-hydrogen mixed gas, higher gas flow for the mixed gas is possible, enhancing interference removal and delivering lower detection limits.

Plus, in Reaction mode, the Universal Cell leverages exclusive dynamic bandpass tuning as an added mass filter, a unique feature to quadrupole cells that eliminates reaction byproducts before they form new interferences, for superior interference removal and lower detection limits.

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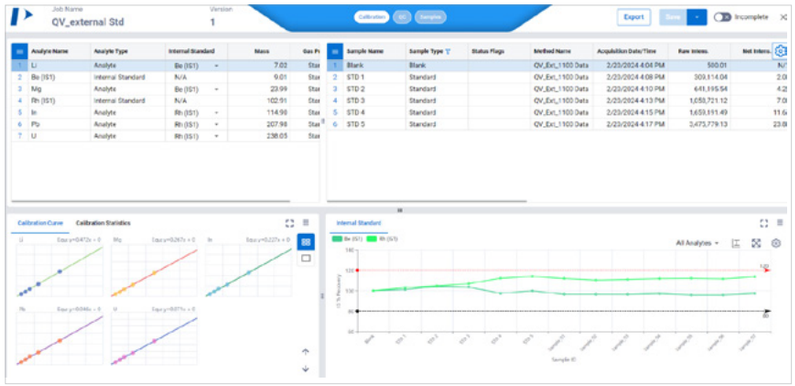
# Upleveling the Lab Experience

What makes the NexION 1100 the platform of choice for day-to-day testing for trace elements?

For starters, its **Syngistix™ for ICP-MS software** provides a streamlined, workflow-based interface that leverages our novel user-friendly, modern **FastQuant Data Viewer**, which introduces new ways of interacting with and reprocessing the data. With the browser-based Data Viewer, you can perform data reviews and processing anywhere, anytime, at any point in your analysis, totally independent from Syngistix software operation. Plus, it's ready to use right out of the box, with little training needed. And thanks to its database backend with ready-to-configure API, LIMS integration becomes easier than ever. This saves costly implementation of data acquisition.

Many routine functions are accessible through the system's novel **LCD touchscreen**, enabling you to perform essential everyday tasks like hardware control, results reviews, instrument parameter diagnostics, analytics, accessing embedded training videos, and more.

And the NexION 1100 system features easy-to-read **LED lighting** that quickly provides status of the instrument – whether operating, acquiring data, or in Standby mode – from anywhere in the laboratory.



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# The Capability to Handle *Your* Matrices

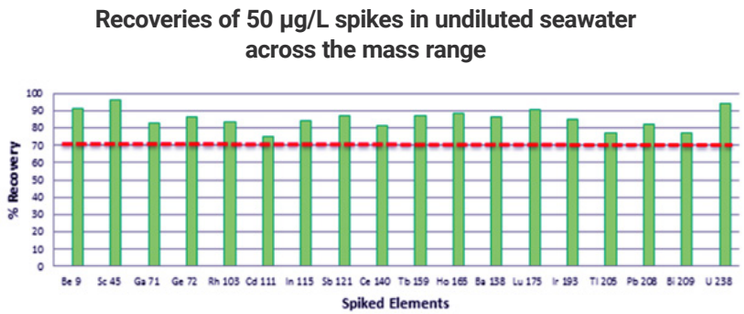
There are few matrices too *complex* or too *simple* for the NexION 1100 ICP-MS to address, from aqueous samples to those with high total dissolved solids – even organic solvents.

Its **All Matrix Solution (AMS)** – a feature on all NexION ICP-MS systems – adjusts the flows of dilution and nebulizer argon gases while maintaining a constant flow to the torch. By varying the initial flows, dilutions up to 200 times can be attained, avoiding offline dilutions of high-matrix samples and the risk of contamination and error. AMS can be used to run undiluted as well as high-matrix samples. Samples with up to 35% total dissolved solids can be introduced directly into the system, improving efficiency.

And with the proprietary **Triple Cone Interface**'s wide-aperture cones and the charged ions' 90° turn in the **Quadrupole Ion Deflector**, unionized components and photons in the matrix are eliminated without entering the cell. This allows you to analyze complex samples at sub-ppt BECs.

What's more, our innovative, specially designed **RF generator** with unique **LumiCoil** technology delivers fast, accurate impedance matching to handle the most difficult matrices and solvents effortlessly. Plus, it adjusts the plasma frequency dynamically based on plasma loading, so you can handle matrix changes on the fly. This combination delivers exceptional instrument stability for top-level performance, robustness, and reliability.

**Technical Note:** Discover the All Matrix Solution for up to 200x online gas dilution



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# Environmentally Conscious ICP-MS

The NexION 1100 ICP-MS boasts a host of features that help laboratories reduce running costs, improve their bottom line, and be much more sustainable. And because it's the lowest maintenance ICP-MS system on the market, it minimizes the number of replacement parts needed over the instrument's lifetime, which reduces electronic and material waste.

### Extended Dynamic Range

This unique technology minimizes the need to rerun samples for low- and high-concentration elements separately, so you can **reduce electricity consumption**.

You use less reagents for diluting samples, fewer filters and other consumables, and less high-purity acids, solvents, and other chemicals.

Plus, with less waste creation, there's a **reduced need for specialized disposal**.

### LumiCoil RF Coil

Unlike traditional coils that require active water or gas cooling, LumiCoil technology is passively cooled as air passes over it.

With a lifetime guarantee and no cleaning required, LumiCoil technology **reduces cost and system downtime and eliminates landfill disposal needs.**

### Universal Cell Technology

This unique quadrupole Collision/Reaction cell with dynamic bandpass tuning can control the reaction in the cell and prevent higher-order product ions from forming, while using **low flows of gas to remove interferences.**

### All Matrix Solution

AMS allows online gas dilution of samples, improving efficiency and reducing opportunities for contamination, while supporting analysis of samples with high total dissolved solids, allowing accurate dilutions up to 200 times.

This **reduces the need to dilute and rerun samples** and **minimizes consumption of laboratory supplies.**

### High Throughput System

The optional High Throughput System (HTS) flow-injection module significantly **reduces sample and washout runtimes,** saving on electrical energy.

### Tubing Saver

With most labs replacing their peristaltic pump tubing every day, the Tubing Saver feature decreases usage and replacement, **reducing plastic waste, specialized disposal needs, and the volume of materials that end up in landfills**.

### LED Lighting

Easily visible LED lighting provides important information about the instrument status.

Early intervention before you've run multiple samples helps **reduce waste, requirements for specialized disposal, and costs.**

### GreenCT Cooling System

Innovative technology allows the use of a cleaner, greener, more affordable coolant, **consumes less power, and generates less waste than traditional lab chillers.**

**Flyer:** See how the NexION ICP-MS series can help laboratories work sustainability into their business plans to reduce downtime, waste, and costs – and improve their economic outlook.

**Product Note:** Check out how GreenCT can help you keep your instrument - and our planet - cool.



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# NexION 1100 ICP-MS
# What's Inside Sets It Apart



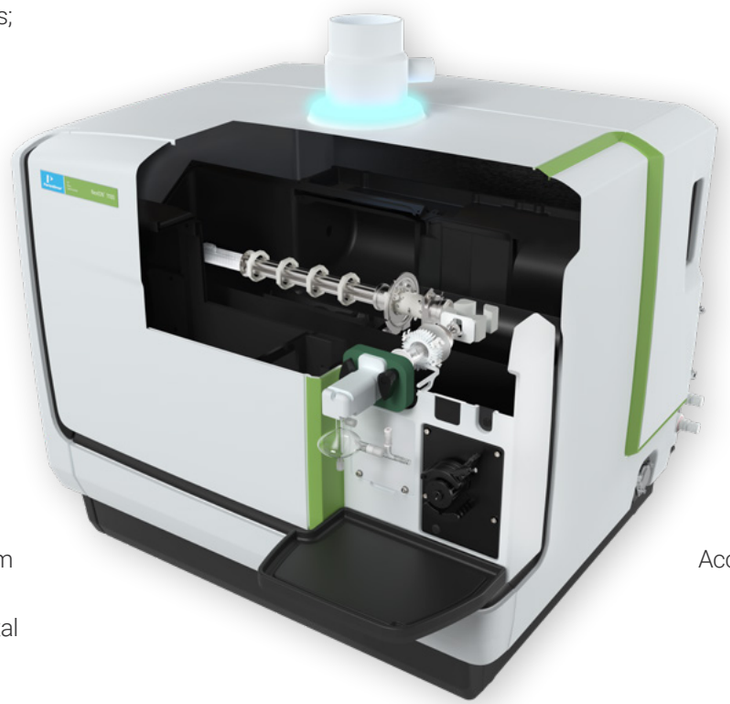
The unique combination of the NexION 1100 ICP-MS system's industry-leading, trusted technologies and the latest proprietary innovations come together to deliver accurate and repeatable results in the lowest maintenance ICP-MS on the market.

### One Channel, Two Modes

Collision mode can easily and effectively handle most day-to-day applications; Reaction mode uses the same gas channel available for enhanced performance.

### Syngistix for ICP-MS Software

Novel FastQuant Data Viewer with database backend introduces new ways of interacting with and reprocessing your data.



### Extended Dynamic Range

Increases the linear dynamic range up to 14 orders of magnitude, enabling analysis of high- and low-concentration analytes in a single run, while protecting the detector.

### LCD Touchscreen and LED Lighting

Optimize user experience with less PC time and more hands-on time running samples.

### All Matrix Solution

Powerful sample introduction system provides online gas dilution for long-term stability when handling high total dissolved solids.

### RF Generator with LumiCoil

Accurate impedance matching to easily handle the most difficult matrices – requires no active cooling or maintenance.

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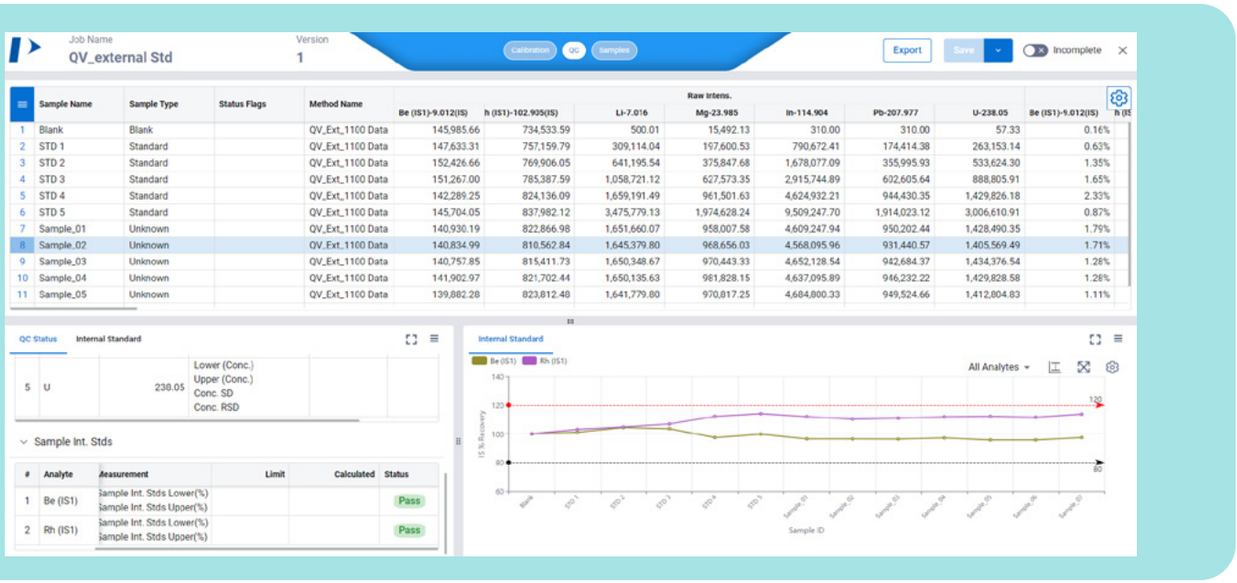
# Software that Transforms Engagement

For high throughput labs running routine applications day in and day out, it's all about data acquisition, review, processing, and reporting. And our graphical, user-friendly **FastQuant Data Viewer** within Syngistix for ICP-MS software is user interactive, enabling you to read data and perform live data reprocessing – in the same place.

It provides real-time updates of analyte concentrations, sample information, calibration, internal standards, and QC results during a run, in a cross-tab format. Single- or multiview calibrations can be displayed, delivering the information you need to make faster decisions and generate more reliable data, while charting of internal and QC standards allows for easy outlier or failure identification.

The four-quadrant FastQuant Data Viewer is ready to use right out of the box, with little training needed, enabling you to configure your own workspace and view relevant data by selecting Analyte, Sample, or Replicates. You can even perform data reprocessing on the fly by changing calibration, reassigning internal standard, and removing replicates.

And Syngistix software's database backend makes it easy to interface with LIMS systems with configurable APIs, so data connections are much simpler and require less costly implementation by users or the LIMS providers: users can open batches or jobs provided directly from LIMS, and datasets associated with the batches or jobs generated by the NexION 1100 system can be sent directly from the software to the LIMS system.



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# Workflows that Work

**Syngistix for ICP-MS software** features a refreshed user interface that conforms to your workflow, delivering a modern, streamlined experience based on familiar left-to-right navigation and a ribbon menu, with icons organized around functional groups.

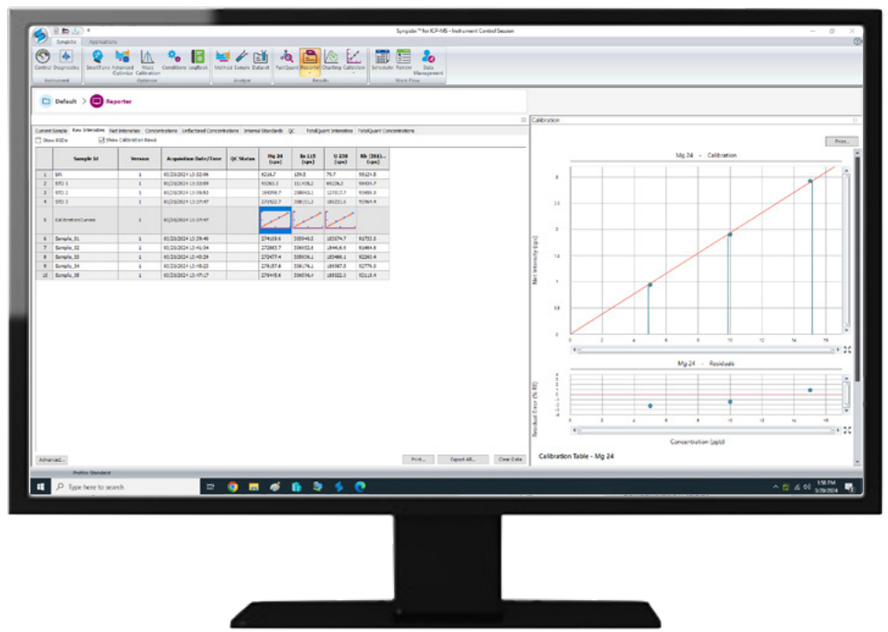
The software provides real-time status information and also controls the critical instrument components, with built-in maintenance reminders that predict consumables usage and remaining lifetime, plus reminders about important upcoming maintenance milestones.

You can choose our one-click SmartTune™ Express, which 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 when they're not. Or opt for SmartTune Manual, executed with preset methods and conditions based on user preferences, which improves operational efficiencies by running only required optimizations routinely.

What's more, the software includes a set of built-in e-methods, such as TotalQuant™, which give you a quick estimate of the concentration of all elements simultaneously, and other popular methods, like US EPA 200.8, that you can use as is. The software features a more simplified experience, with autofill correction equations, gas modes and parameters, and more.

The software also provides customizable, interactive data visualization and interpretation, while user-defined and customizable reporting capabilities facilitate support for a variety of peripherals, including online autodilution and laser ablation systems.

And for pharmaceutical and other highly regulated industries, optional Enhanced Security™ software for 21 CFR Part 11 comes with a standalone admin application for license activation, user management, role assignment, and project/data management, as well as automated method validation or USP <233>.



**Product Note:** Learn more about the benefits of Syngistix for ICP-MS software



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# Ensuring Drinking Water Is Pure, Safe, and Healthful



A key mandate for local governments and municipalities everywhere is maintaining the health and safety of the water supply. So contract, governmental, and municipal testing labs conducting trace elemental analyses need accurate data and fast sample turnaround times to keep their constituents – and neighbors – supplied with clean, pure drinking water.

To that end, the NexION 1100 ICP-MS offers industry-leading throughput, unmatched interference removal capabilities, and a modern, simplified user experience, providing a low-maintenance, cost-efficient workhorse solution for environmental analysis.

This is an exceptionally high-throughput system for water testing – less than one minute per sample for 56 elements you test for every day. Its single gas channel provides a universal solution for most elements, with **both Collision and Reaction modes in one channel**, so all elements can be analyzed with a single gas without wasting time switching between them. Plus, the Extended Dynamic Range capability allows you to analyze both low- and high-concentration elements in a single run, maximizing your lab's efficiency. And with the All Matrix Solution 200x on-the-fly gas dilution, High Throughput System flow-injection compatibility, and Collision mode gas-switching time of under three seconds, you have a high-throughput, everyday ICP-MS that's ideal for water-testing labs.

It's also the **lowest-maintenance ICP-MS system** on the market, delivering more uptime for science and less time spent on routine maintenance. With lower argon consumption at lower RF power and additional power savings with the optional GreenCT cooling system, you have an environmentally conscious, sustainable system for the long haul – and one that meets EPA, ISO, GB (China), and other regulatory requirements for environmental testing.

The benefits of the NexION 1100 ICP-MS can be leveraged across a wide range of application areas.
**Click here to download all available application notes.**

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# Prescription for Quality Pharmaceuticals



Quality assurance, quality control: they're key components of every pharmaceutical manufacturing process. So for managers and analysts of pharma QA/QC labs conducting everyday trace-elemental analyses that depend on accurate and reliable data per USP/ICH requirements, the NexION 1100 ICP-MS is an ideal solution. And with unmatched interference removal and **Syngistix for ICP-MS Enhanced Security software** for 21 CFR Part 11 compliance, it's also efficient and easy-to-operate.

For highly regulated environments like yours, compliance is the priority. Our comprehensive Syngistix Enhanced Security software's setup feature allows your administrators to establish user and group permissions, assign data folders, and customize electronic signatures with just a few clicks. It enables side-by-side comparison of results and calibrations in Reporter View, plus the ability to review results and add signatures. Audit trails are enabled with login and security history, extensive file versioning, the Review/Approve feature for data, and all file changes with e-signature information.

In addition, we offer a number of qualification protocols and services for lab instruments, ensuring complete, consistent, accurate data, including qualification protocols using calibration standards, custom protocol development, execution of customer-developed protocols, and an IQ/OQ protocol library to leverage. Best of all, you get accurate, reliable data as per USP <232>/ICH Q3D requirements – all via an efficient, simple, modern user interface.

The benefits of the NexION 1100 ICP-MS can be leveraged across a wide range of application areas.
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# Food Testing for a Hungry World



For food producers, the priorities are to deliver the food products the world wants and needs, bearing in mind the increased awareness of the importance of food quality and safety, and ensuring processes are efficient and consistent, and that margins are maximized at every step of the value chain.

That's why in-house or contract labs conducting trace-elemental analysis, that requires accurate result at lower detection levels with high uptime and throughput, are looking to the NexION 1100 ICP-MS to deliver flexible, superior interference removal and low cost of operation in an easy-to-use workhorse solution for food testing.

To boost throughput, our proprietary **Extended Dynamic Range (EDR)** technology increases linear dynamic range to $10^{14}$, allowing you to run both high- and low-concentration analytes in a single analytical run, resulting in fewer reruns. Flexibility is enhanced, too, by the ability to run in either Collision or Reaction mode for various applications while futureproofing your lab through an upgrade path to two or even three gas channels.

Reaching the lowest possible detection levels is key in your industry, and the NexION 1100 system's unique **three-quad design** lets you control interferences as early as the Quadrupole Ion Deflector. Plus, when in single- or mixed-gas Collision mode, you enjoy sufficiently low detection levels to handle most applications – and to deliver the reproducible results you're after. In Reaction mode using helium-hydrogen or other pure reaction gases, you get low detection limits and repeatable, reliable results. Plus, the novel capability of using a higher helium-hydrogen gas flow delivers even better interference removal and lower detection limits, especially for relevant food safety test elements.

This is also the lowest-maintenance ICP-MS on the market, delivering more uptime for science and less time spent on everyday maintenance. And with lower argon consumption at lower power, plus power savings via the optional GreenCT cooling system, you have an environmentally conscious system for the applications you depend on most.

The benefits of the NexION 1100 ICP-MS can be leveraged across a wide range of application areas.
**Click here to download all available application notes.**

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# Precision-Engineered Consumables

NexION 1100 ICP-MS consumables and supplies are designed with your instrument in mind, with each part fit to perform and manufactured with the highest quality materials available. Whether you're looking for sample introduction components or standards, we have the consumables you need to keep your NexION 1100 instrument up and running smoothly and efficiently. Only by using genuine PerkinElmer consumables will you be able to fully and consistently enjoy the exceptional performance of the NexION 1100 system.

### Sample Introduction Solutions

NexION SMARTintro™ sample introduction kits are tested as a complete unit to ensure intra- and interlaboratory performance. Each system utilizes specific combinations of sample introduction components, and the kits are color-coded according to user application.

### Cones

Precision-designed and manufactured, wide-aperture sampler and skimmer cones provide superior long-term stability and resist clogging, allowing analysis under both low and high sample-uptake conditions.

### Standards

We offer a complete selection of atomic spectroscopy reference materials that are tested and proven to provide the certified quality and reliability you expect for all your application needs.



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# At Your Service

Today's lab managers face a variety of challenges, from tighter schedules to increased workloads and budget control to teams with varying levels of familiarity with lab equipment. We help you overcome the obstacles to your success.

OneSource® Laboratory Services offers scalable and flexible options for labs of all sizes, for PerkinElmer and non-PerkinElmer equipment.

We're here to help maximize your workflows, from beginning to end. Explore what suits you best.

## Trust in Our Expertise

**Instrument Repair, Service Contracts, and System Maintenance**

Be confident that your equipment will work as expected, every time you turn it on – anywhere.

**Asset Management, Dashboards, and Optimization**

Harness the power of data to optimize operating and capital expenses and improve lab performance.

**Education and Training**

Empower your lab staff with the knowledge and skills to take full advantage of the capabilities of modern lab equipment.

**OneSource Integrated Laboratory Solutions Services**

Get support for all your noncore but critical laboratory activities, freeing up your scientists to concentrate on the science at hand.

OneSource Laboratory Solutions



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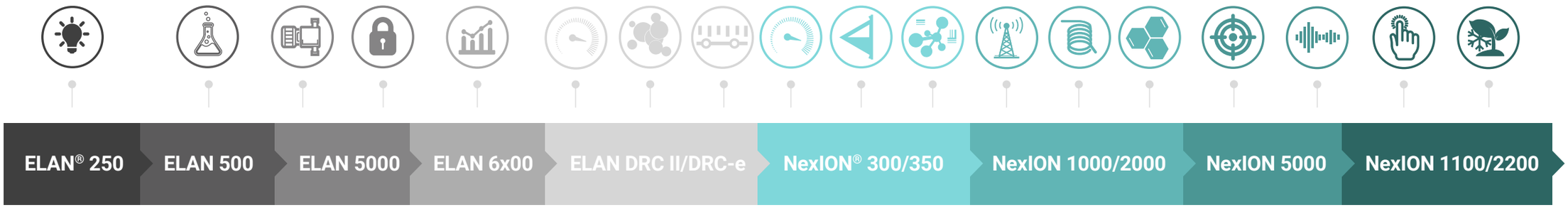
# PerkinElmer and ICP-MS: A History of Innovation




**1983** First Commercial ICP-MS

**1987** Inert Sample Introduction

**1989** Turbo Pumps

**1989** PlasmaLok™

**1994** Dual Detector

**1999** Dynamic Reaction Cell

**2001** Axial Field Technology

**2007** Extended Dynamic Range

**2010** Universal Cell Technology™

**2010** Triple Cone Interface

**2014** Single Particle ICP-MS

**2017** 34-MHz RF Generator

**2017** LumiCoil™

**2017** Single Cell ICP-MS

**2020** First Commercial Four-Quadrupole ICP-MS

**2020** OmniRing™

**2023** LCD Touchscreen

**2023** GreenCT™

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