ELAN 9000

optimizing routine ultratrace analysis by ICP-MS

PerkinElmerSCIEX™

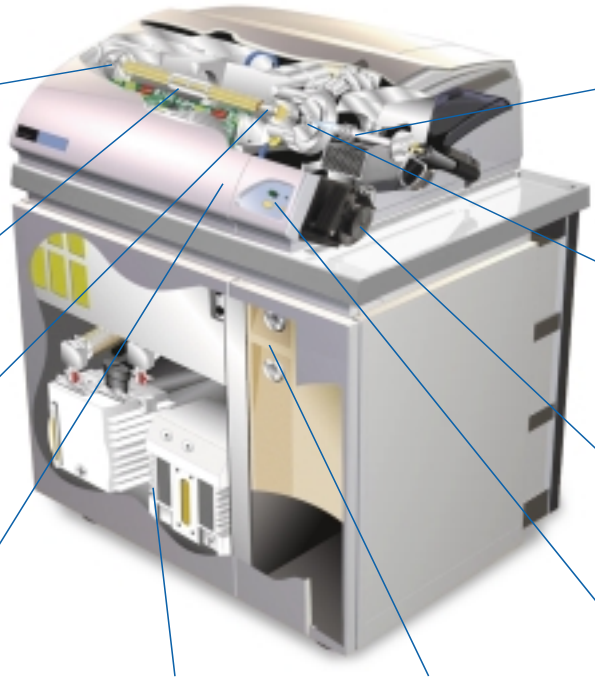
the right answer, now

The ELAN® 9000 ICP-MS instrument is perfect for laboratories looking to take advantage of the powers of detection of an ICP-MS. It incorporates proven ICP-MS technology based on 40 years of innovation and listening to our customers. The ELAN 9000 simplifies ICP-MS by providing an easy-to-use, easy-to-maintain tool for routine ultratrace level analysis. It is ideal for environmental, clinical, geochemical and general testing laboratories with moderate to heavy loads of ultratrace-level samples.

The proven design of the ELAN 9000 ICP-MS ensures accuracy, improves method development and consistently delivers the correct answer, reducing rework and improving productivity. In high-throughput environments, the ELAN 9000 ICP-MS offers substantial speed and performance advantages over graphite furnace atomic absorption spectroscopy. Design enhancements provide increased reliability and reduced cost of ownership, when compared with other ICP-MS systems.

Superior detection limits

The ELAN 9000 ICP-MS performs analyses at the parts-per-trillion level and lower. The custom resolution feature allows you to selectively adjust resolution for individual masses, while maintaining nominal resolution across the mass range, minimizing spectral interferences, extending working ranges and improving detection limits. The unique AutoLens™ feature optimizes the lens voltage for each element. This powerful feature maximizes analyte signals and minimizes matrix interferences during multielement runs, providing maximum sensitivity.



SimulScan
Simultaneous dual-stage detector with 8 orders of dynamic range

High-speed Quadrupole
Fast transient-signal analysis

AutoLens
Optimizes voltage for each element

AutoRes™
Custom resolution minimizes spectral interferences and improves detection limits

Integrated Roughing Pumps
Simplify installation and service

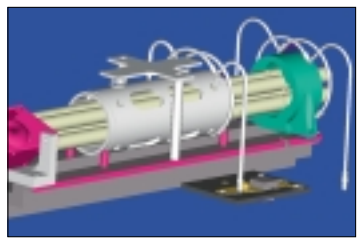
40 MHz Free-running Generator
Efficient, robust plasma

AutoStart and AutoStop
Ready when you arrive, keeps working after you leave

PlasmaLok
Easy optimization and extended cone life

Nickel Quick-change Interface Cones
Easy maintenance, maximum uptime and low cost

Integrated Peristaltic Pump with Tubing Saver
Improves productivity and extends pump-tubing lifetime



High frequency 2.5 MHz quadrupole for high-resolution and abundance sensitivity – provides proven rock-solid mass-calibration stability.

Unlike other ICP-MS systems that drift and require a time-consuming, multi-point data collection process, the ELAN 9000 ICP-MS is stable enough to perform single-point, peak-hopping data collection without any compromises, achieving the best detection limits in the shortest time. Excellent, long-term quadrupole stability means that peaks do not shift over time, so there is no need to repeat time-consuming mass calibrations.

More samples, less time

With over 20 years of experience in ICP-MS, we have built efficiency into every system. The sample introduction system uses an integrated peristaltic pump to dramatically reduce sample uptake time. The non-cooled spray chamber provides unequaled sample washout. This minimizes time between samples and ensures that the matrix from the previous sample is eliminated before you start the next sample.

The sample introduction system is completely HF-resistant, so you can run any liquid sample, including corrosive matrices, without risking damage to the system. The ELAN 9000 ICP-MS features a new, innovative torch design that is fully modular, demountable, rugged and easy to maintain (Figure 1). Because the torch ignites in place, the signal is always optimized. The ICP load coil does not require external cooling and there is no need to spend time adjusting and re-optimizing the torch position prior to beginning work. The unique, patented PlasmaLok® interface eliminates secondary discharges, guaranteeing excellent signal precision and long-term stability. You can use one standard set of conditions to run all the elements, without affecting the signal – you can go from wet to dry or from cool to hot plasma conditions, without making adjustments.

Additionally, the SimulScan™ dual-stage detector measures both high- and low-level analytes simultaneously. This conserves valuable or limited samples, eliminates the need to perform time-consuming sample dilutions and allows you to quickly characterize unknown samples.

Rugged design ensures stability

Rugged construction means the system will perform even in the most difficult environments with the dirtiest of samples. The ELAN 9000 ICP-MS is the instrument of choice for geological exploration laboratories, where rock digests are run 24 hours per day.

The PerkinElmer SCIEX™ patented ShadowStop™ prevents photons and un-ionized matrix constituents from entering the quadrupole, lowering system background and eliminating drift. This innovation also enhances ease-of-use because the ShadowStop is grounded, making it a passive part of the ion optic design. Unlike systems that use active lens elements to bend the ion beam away from photons emitted by the plasma, the ELAN 9000 ICP-MS does not require continual lens-voltage adjustments.

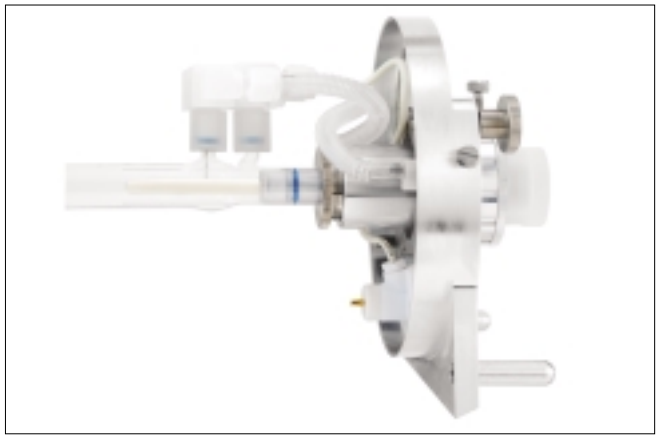


Figure 1. Sample introduction torch-mount cassette. Changing torch components is a simple process – no tools are required.

Our advanced instrument design permits use of a heat-exchanger-based cooling system, replacing expensive and unreliable chillers without compromising speed or sensitivity. Plus, the overall system design allows you to run more samples between calibrations. Large-orifice cones provide superior, long-term stability and resist clogging, allowing analysis under both high and low sample-uptake conditions.

easy operation and maintenance

The ELAN 9000 instrument brings a whole new level of usability to ICP-MS. Utilizing the powerful Windows XP operating system, the simple, intuitive software makes ICP-MS accessible to novices and experts alike. The software is designed specifically for ICP-MS and includes helpful guidelines that assist users in selecting the best mass for their particular matrices. Priority samples, flexible quality-control checks, transient signal handling, speciation analysis, runlist build and customizable reporting are just a few of the features that will make your life easier (Figure 2). Integrated maintenance videos and our new PathFinder™ HTML-based Help system take the guess work out of routine tasks. The SmartTune™ software wizard automatically sets up all your tuning procedures, runs them in the sequence you select and reports the results based on user-selected pass/fail criteria (Figure 3). The software includes a library of standard reports and provides the flexibility to customize reports for your methods, without having to use a complicated macro language or exit to another program. The powerful ELAN software provides effortless operation, all day, every day.

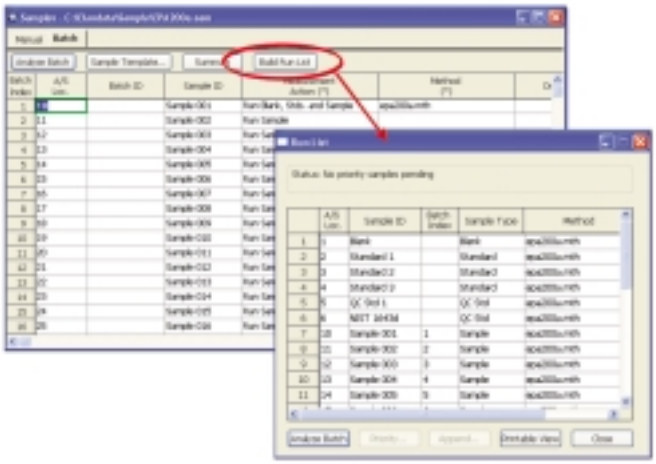


Figure 2. The new Build Run List feature will automatically build an exact listing of all your standards, quality-control checks and samples before you start your automated analysis – eliminating unexpected sample-run orders and errors.

One-touch ion lens adjustment

Unlike other systems that require iterative adjustments to the ion optics, the ELAN's single ion lens is adjusted automatically with the touch of a button. Computer-controlled auto-optimization of the ion optics eliminates the possibility of misadjustment that can lead to poor performance.

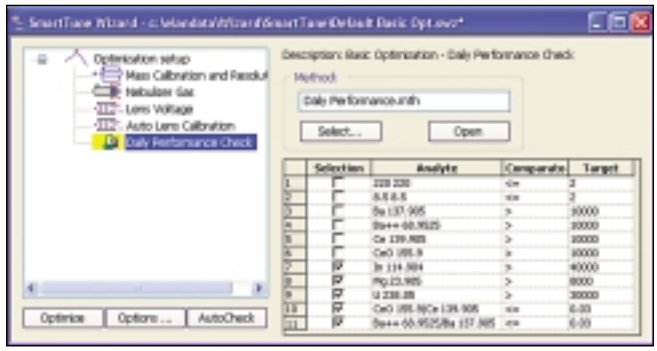


Figure 3. The SmartTune optimization wizard sets up user-defined optimization and performance-check procedures, automatically running them while you perform other tasks – maximizing your productivity.

The industry's only single ion lens

Changing the new and improved exclusive SwiftMount™ II lens is faster and simpler than ever before (Figure 4). No tools are required as the design incorporates a clean capture-and-release concept. In fact, the process takes less than 60 seconds, while competitive lens systems that have 30 to 40 pieces are very difficult to clean and reassemble. And, since the lens is only one piece, there is no need to restabilize the system after cleaning.

Figure 4. SwiftMount II quick-change lens mount. Snap-in-place design makes removal or installation a two-finger operation.

Method development made easy

With the ELAN system, method development is easier than ever. The PathFinder guide acts as an on-line consultant, leading you step-by-step through the method development process. Simply select the elements you need to measure – the software will help you pick the appropriate mass based on abundance and potential interferences. Additionally, several turnkey environmental and clinical methods are available, eliminating method development for these applications.

Using the ELAN TotalQuant™ feature, only one standard is required to obtain estimated concentrations for all elements. This is particularly useful for survey work, since it helps characterize what is in an unknown sample, while providing an approximate concentration.

Designed for regulatory compliance

The optional ELAN Enhanced Security™ (ES) software gives you the security, data integrity and traceability tools needed to develop FDA-compliant standard operating procedures, whether you are in a research or manufacturing environment. User authenticity is verified by ELAN ES software to ensure that access is limited to authorized individuals and permissions to perform specific tasks are controlled. All raw data, including methods and parameters used, are stored in an encrypted, checksum-protected dataset, in order to guard against data tampering. Audit trails that capture file, system and security-related events provide traceability for most software applications.

The powerful quality-control system allows you to set limits, parameters and standards based on U.S. EPA or other quality-control guidelines. The software interprets the data and takes user-specified actions, if results fall out of range.

The AutoStart™ and AutoStop™ features allow the system to begin working while you travel to work and continue running unattended after you have left for the day, extending productivity beyond normal working hours. The Tubing Saver feature ensures optimum measurement precision and prolongs peristaltic tube lifetimes. The feature allows clamping of pump tubing prior to an unattended run, without damaging the tubing. This capability, combined with automatic quality-control checking, instrument sensors and software protocols that monitor over 70 test points, ensures that the system is operating safely and accurately even when you are not there.

Easy maintenance, low cost of ownership

The ELAN 9000 ICP-MS is not only easy to use – it is easy to maintain as well. Designed with accessibility in mind, the compact instrument has doors on all four sides, making it easy to reach any part of the system. Installation is simple as no expensive modifications to lab benches are required.

The vacuum-chamber design provides independent access to each vacuum region, allowing maintenance to be performed in one region without affecting the other. The compact design and integrated castors allow the instrument to be easily relocated as laboratory needs change. Additionally, video clips of maintenance procedures help your staff fully understand and perform routine system maintenance.

The dual-inlet turbo pump replaces costly multi-pump configurations, increasing reliability while reducing cost of ownership. The pump features built-in corrosive purge capability, enabling any system to analyze phosphoric acid samples by adding an optional tubing kit.

The ELAN 9000 ICP-MS also offers the industry's lowest cost of ownership. PerkinElmer SCIEX's sixth-generation ICP-MS has proven, exceptional uptime. Plus, the minimal routine maintenance and long-lasting consumables help minimize ongoing financial commitments. For example, the PlasmaLok interface minimizes clogging and discharge erosion on the cones, reducing cleaning, routine maintenance and replacement costs. The ELAN ICP-MS cone design makes removal and replacement easy because cones simply thread or glide into place, allowing you to change them in less than 30 seconds.

the undisputed leader in ICP-MS

For over 20 years, PerkinElmer and SCIEX have partnered to develop and distribute the most innovative and powerful ICP-MS systems. There are over 2500 ICP-MS systems installed in industries ranging from environmental and clinical to semiconductor, geochemical and metallurgical, making PerkinElmer SCIEX the industry leader in ICP-MS.

Unlike competitive systems that utilize compromised designs, the ELAN 9000 ICP-MS is a sixth-generation instrument. With each generation, the systems have become more reliable, more rugged, more accurate, more economical and easier to use.

Integrated solutions for every application

The ELAN 9000 ICP-MS provides the flexibility required to handle even the most difficult applications. Using a wide selection of options and accessories, we can build a complete, fully-integrated system that fits your specific application.

PerkinElmer is the leader in flow injection atomic spectroscopy (FIAS), which is an extremely efficient liquid-sample management technique. The two-pump FIAS accessory is available with both 5- and 8-port injection valves and provides low carryover, enhancing productivity. The FIAS is useful for such applications as low-level mercury and selenium determinations.

A variety of autosamplers are available as well (Figure 6). These corrosion-resistant samplers feature a continuous flow-through rinse station, which virtually eliminates sample carryover and cross-contamination.

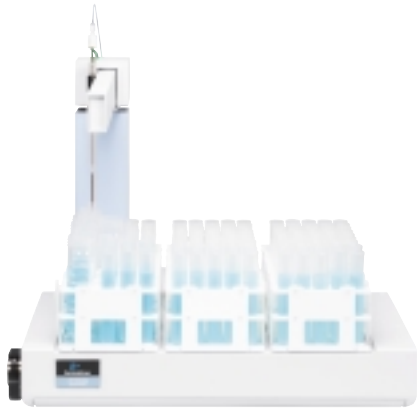


Figure 6. AS-93*plus* autosampler maximizes laboratory productivity.

Superior Value	Unrivaled Benefit
Proven quality product	Quick installation and extremely high uptime, maximizing investment
Intuitive software designed for inorganic analysis – built on 40 years of experience in atomic spectroscopy	Easier to learn, easier to use, with functionality needed for ultratrace analysis
Rugged interface with large-orifice cones	Unmatched stability with real-world samples that contain high-dissolved solids
Unrivaled simplicity in ion-lens changing and maintenance	Ease of operation and enhanced productivity
Patented PlasmaLok interface	Less time optimizing, more time running samples
Quick-washout sample introduction system combined with rapid-scanning quadrupole	Unsurpassed sample throughput and productivity
Wide variety of sampling accessories	Flexibility allows you to expand into new application areas, including speciation

The ELAN ICP-MS is easily integrated with liquid chromatography (LC) and ion chromatography (IC) systems, providing a complete solution for the separation and determination of individual metal compounds (Figure 7). With Chromera™ software, the ELAN ICP-MS provides a complete solution for your speciation needs.

A variety of sample-introduction accessories are also available. These include ultrasonic, desolvating and micro-volume nebulizers, as well as cyclonic and cooled spray chambers.

Laser sampling accessories make solids analyses routine. Variable-power UV lasers automatically vaporize a portion of the sample and transport it to the ELAN ICP-MS for analysis. Using laser sampling, applications such as small-inclusion analysis, spatial profiling and bulk-solids analysis are made easy.

The Multiwave™ microwave-digestion system simplifies sample preparation for all sample types, including foods, oils, plastics, environmental samples and many more.

The ELAN 9000 ICP-MS seamlessly interfaces to a piston-driven autodilution system, diluting samples up to 100 times with unequaled precision. Unlike dilution systems that incorporate peristaltic pumps, the system uses piston-driven pumps to provide precise dilution measurements, ensuring consistent, accurate and reproducible results.

Figure 7. Chromatographic separations using the Series 200 HPLC system in conjunction with ICP-MS detection are used to perform speciation analysis.

A history of innovation by PerkinElmer SCIEX

1983 – SCIEX introduces first commercial ICP-MS

1986 – PerkinElmer SCIEX joint venture established

1990 – PerkinElmer SCIEX shows first ICP-MS with turbomolecular pumps

1994 – PerkinElmer SCIEX introduces ELAN 6000

- First ICP-MS with simultaneous extended dynamic-range detector
- First ICP-MS with single, scanning lens optimized for ICP-MS
- Improved signal-to-noise ratios through single-point peak hopping

1999 – PerkinElmer SCIEX introduces ELAN 6100

- Stable torch mount eliminates the need for XYZ adjustment

1999 – PerkinElmer SCIEX introduces DRC technology

- First system with automated DRC optimization and Dynamic Bandpass Tuning
- Pittcon Editors' Award – Gold medal

2001 – PerkinElmer SCIEX introduces the ELAN DRC Plus

- 2nd-generation DRC instrument with Axial Field Technology for optimal performance in all matrices

2002 – PerkinElmer SCIEX introduces the ELAN DRC II

- New design allows use of heat-exchanger-based cooling system

2003 – PerkinElmer SCIEX introduces the ELAN DRC-e

- First DRC system for routine analytical use in high-throughput labs
- Enhanced ELAN software speeds setup and optimization, provides new features to make ICP-MS even easier

2005 – PerkinElmer SCIEX introduces a new ELAN family

- Chromera software radically simplifies speciation measurements
- New, simple torch cassette and tool-less lens mount

PerkinElmer, Inc.

Expect more from the leader in inorganic analysis

With over 40 years experience and a product line that includes flame AA systems, high-performance graphite furnace AA systems, flexible ICP-OES systems and the most powerful ICP-MS systems, PerkinElmer is the undisputed leader in inorganic analysis. We have placed over 40,000 systems throughout the world, performing inorganic analyses every hour of every day. With the largest technical service and support staff in the industry and a solid reputation for quality products and service, the ELAN 9000 instruments deliver the performance required to maximize ICP-MS performance and productivity.

Whatever you're looking for, we've got it

PerkinElmer is a world leader in chemical analysis. Our analytical instrument technologies serve the fast-evolving pharmaceutical, chemical, forensics, environmental and semiconductor industries, providing integrated solutions – from sample handling and analysis to communication of test results.

As one of the best-known brands in research, analysis and testing, ours was probably the first analytical instrument you ever used. In addition to our ICP-MS systems, we offer a broad range of solutions in Luminescence, UV-Vis, NIR, GC, GC/MS, MALDI-TOF MS, HPLC, AA, ICP-OES, Thermal Analysis, Elemental Analysis, FTIR and LIMS. There are over 60 years of experience built into every product we make. So, for leading edge R&D and demanding QA/QC, you get the speed, accuracy and reliability you seek – for the productivity you need.

Unbeatable service and support – worldwide

Maybe you are new to ICP-MS or maybe you are an expert who wants to discuss an application with a knowledgeable ICP-MS scientist. In either case, PerkinElmer SCIEX has more people focused on ICP-MS applications than any other company. Clearly, we understand sample preparation, interferences and method-development issues facing today's laboratory. With extensive applications experience and knowledgeable service specialists, you can be assured that our organization is here for you well after the system has been installed.

Our service and support teams are located in 125 countries throughout the world and are factory trained. Compliance doesn't get any easier than with our software, including 21 CFR Part 11 technical compliance on many products. And, convenient consumables and accessories ordering lets you get your hands on what you need fast.

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