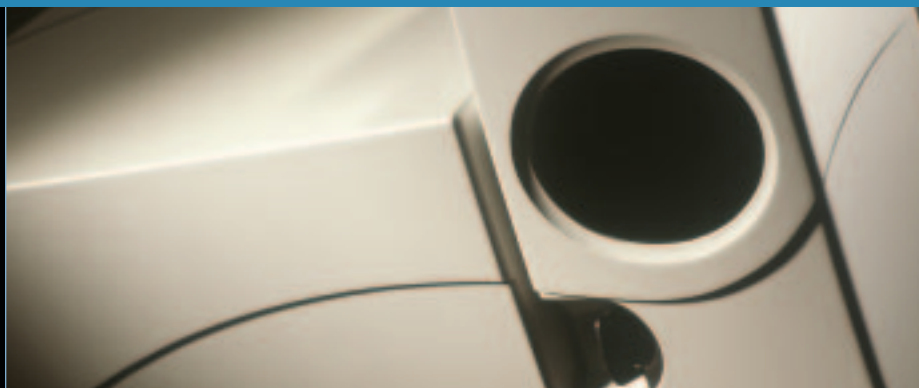


X Series ICP-MS



Practicality, Productivity, Performance

X Series ICP-MS

Taking ICP-MS to higher levels of performance and productivity

Thermo Electron Corporation's X Series ICP-MS (Inductively Coupled Plasma Mass Spectrometer) is a robust analytical instrument capable of meeting the most challenging requirements. It is a powerful and precise measurement tool designed to maximize productivity in the laboratory across a wide range of applications.

The X Series ICP-MS offers analytical scientists:

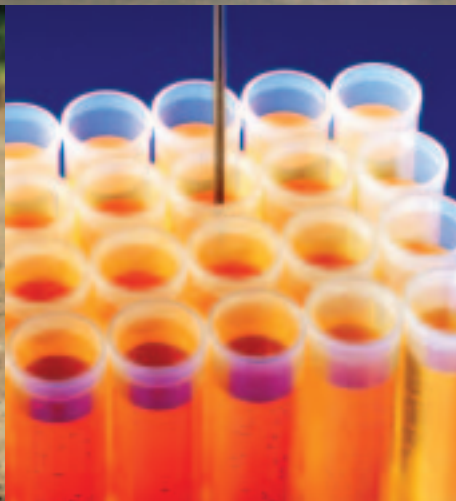
- The world's smallest benchtop ICP-MS
- The highest throughput with protocol compliance
- An ICP-MS where the mass spectrometer parts require no user maintenance
- Unlimited flexibility through complete Plug-and-play upgradeability
- Rapid start-up through Productivity packs for routine analyses and comprehensive operator training courses

With the X Series, Thermo Electron provide not just an analytical instrument, but a complete laboratory solution that includes proven, and reliable hardware, fully featured software, ongoing methods development, and customer application support and training. All backed by a responsive worldwide service organisation and on-line knowledgeable technical support.

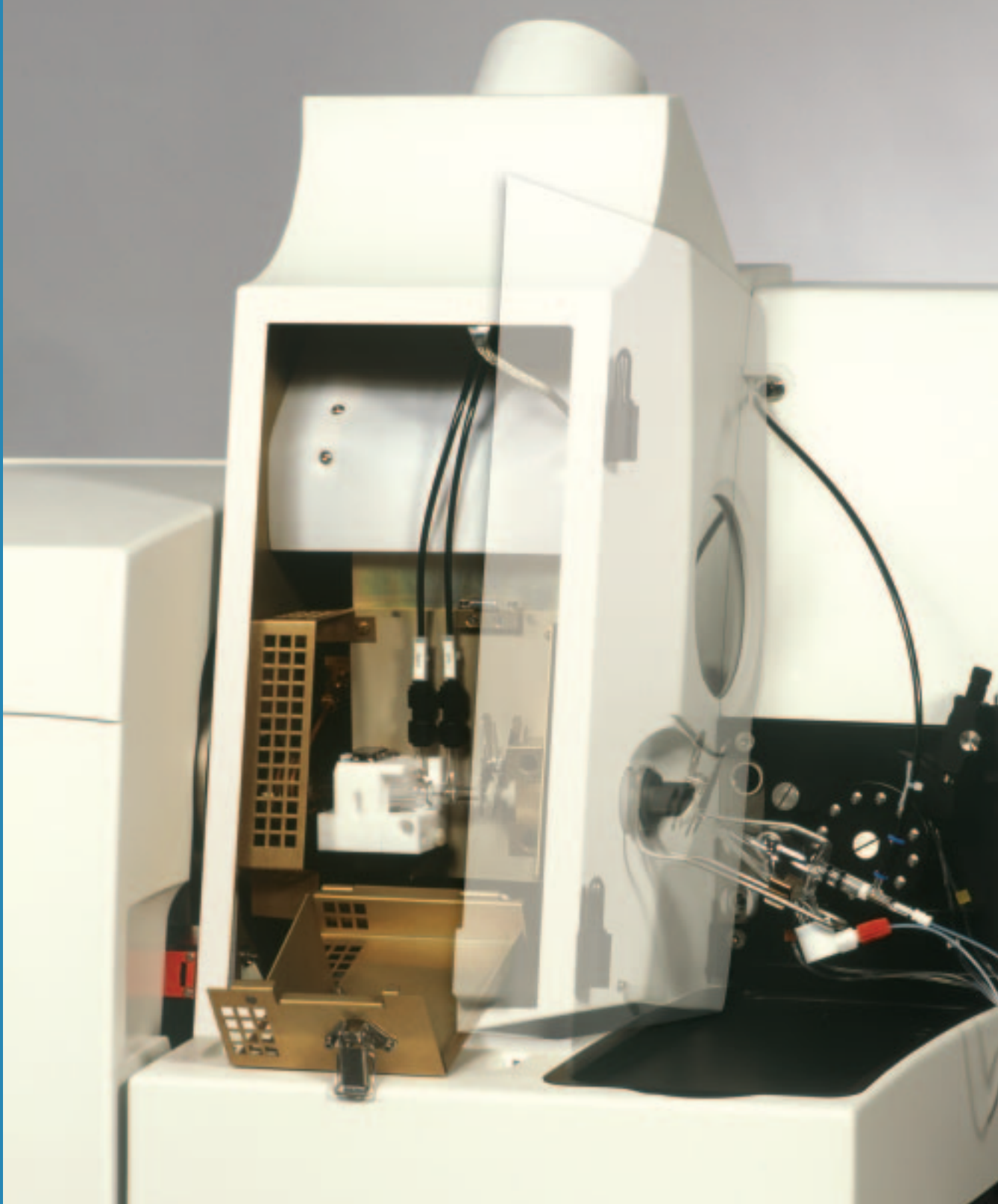


X Series ICP-MS

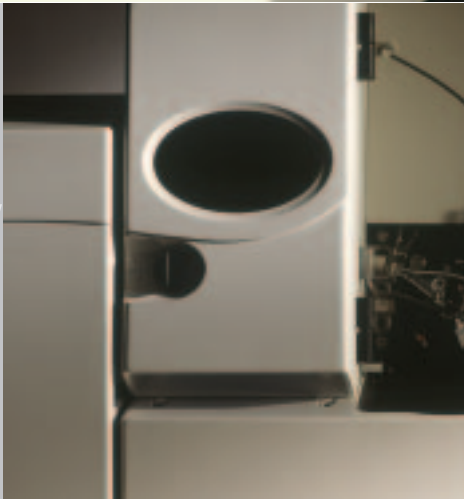




X Series ICP-MS
Practicality, Productivity, Performance



Practicality



Maximum Uptime ... Minimum Maintenance

Advanced technology doesn't have to be complicated. The X Series ICP-MS makes even the most sophisticated of analytical protocols easy to implement.

World's smallest benchtop ICP-MS

Thermo Electron has designed the world's smallest benchtop ICP-MS with today's busy laboratories in mind. With covers constructed from inert composite materials, the X Series ICP-MS is equally at home in either high throughput environmental monitoring laboratories, busy clinical analysis laboratories or demanding semiconductor clean room environments, where space is at a premium.

Careful attention to detail ensures that both heat dissipation and extraction requirements are minimized, reducing environmental contamination and initial start-up costs.

Maintenance-free mass spectrometer

Based on innovative design models used in consumer manufacturing processes, a radical new engineering approach has produced an ICP-MS solution that's as practical as it is powerful. The maintenance-free Infinity Lens™, quadrupole and detector systems ensure maximum productivity between scheduled preventive maintenance visits.



Proven simultaneous Detector technology

An advanced "plug in" simultaneous detector system field proven for high sample throughput applications accurately measures major and minor concentrations in a single analytical run.

A unique cradle design ensures no cable connections inside the high vacuum area for improved reliability and easy end user replacement.

Future-proof technology

Intelligent modular design and a range of unique plug-and-play performance options provide flexibility and a guaranteed upgrade path to maintain future regulatory compliance.

Highest signal-to-noise ratio of any ICP-MS with collision cell capability

A compact, top-entry, cable-free vacuum housing incorporating the robust Infinity Lens and an off-axis high-performance quadrupole mass analyzer combine to deliver the highest signal-to-noise ratio of any ICP-MS, with the added bonus that the entire ion optics are identical in both CCT and non-CCT instruments.



Optimised Sample Interface

The Xi Interface maximizes polyatomic species in complex environmental matrices enabling the detection of iron at single-figure ppb levels in standard ICP-MS operation. Unique properties of the interface effectively extend the working range of the mass spectrometer enabling the measurement of Na and other alkali metals to over 200 mg/l in the same mass scan as ng/l levels of trace analytes such as Pb and Cd.

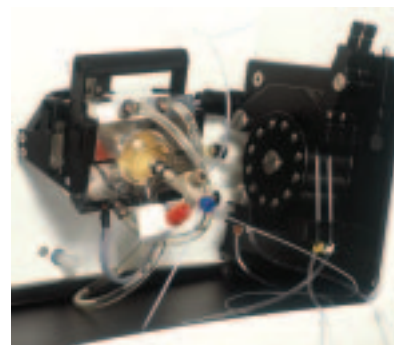
By using the X Series switchable quadrupole resolution, this dynamic range can be extended even further to over 400 mg/l for sodium.

Optimized, accessible sample introduction

An efficient, externally mounted sample introduction system is the foundation to maximizing sample throughput. The open architecture ensures easy maintenance and trouble-free connection to third party accessories.

Optimized plasma conditions

Three high-precision mass flow controllers and automated x, y, z torch positioning maintain optimum plasma conditions ensuring consistent, reliable results within an analytical protocol.



Productivity packs

Predefined protocols facilitate worldwide regulatory compliance reducing start-up time and increasing productivity. Method templates, optimized acquisition parameters and customized reporting options are included to ensure the lowest cost per sample analysis.

Unique productivity enhancement tools such as intelligent monitored uptake/rinse and protocol optimized autotune parameters significantly improve throughput and operating efficiency.

Even the simplest configuration of the X Series ICP-MS guarantees conformance to latest worldwide environmental regulatory protocols including US EPA 200.8, US EPA 6020A, US ILM 05.2D, Japanese JIS K0102, German TVO, and UK DWI NS30.

The X Series ICP-MS is also ideally suited to the analysis of a wide variety samples in other market areas, which demand high analytical performance coupled with high sample throughput and maximum uptime. The X Series handles clinical and pharmaceutical matrices with ease, facilitating toxicology, nutritional and biomedical studies.



Productivity



Ease of Use and Performance Combined

PlasmaLab software for X Series ICP-MS gives the operator seamless control of all ICP-MS analysis routines, drawing on the ideas and best working practices of over 20 years of ICP-MS experience.

Operator-friendly

All key system operations can be performed automatically, from simple wizard interfaces. Performance Reports and Auto-tune routines ensure that the system is always set-up consistently and enables total unattended operation.

“Designed-in” application-specific protocols

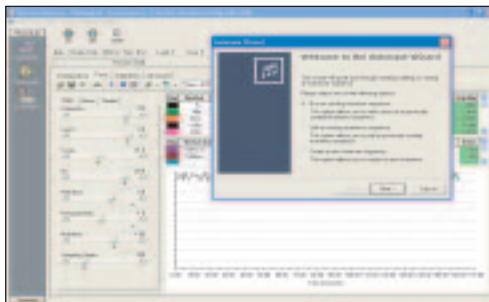
Templates can be tailored specifically to your application needs to make it easy even for inexperienced operators to achieve quick, accurate results.

Integral QA/QC package

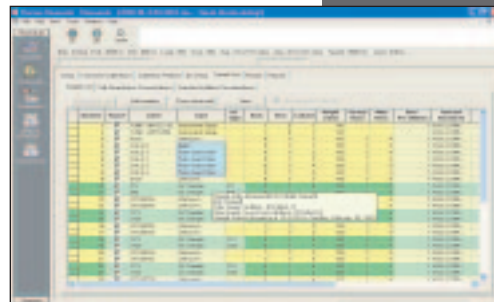
Automated real-time data validation routines significantly reduce the number of sample re-runs, improve productivity and reduce overall cost per analysis.

Flexible reporting

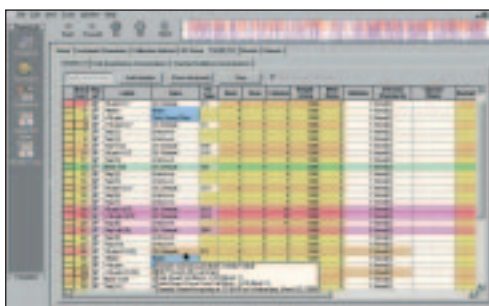
Analytical reports can be adjusted to your laboratory requirements, using PlasmaLab's flexible report generation and LIMS connectivity.



Simplicity through automation



Simple spreadsheet style data entry



Sample list showing QC flags



Flexible report generation and data export



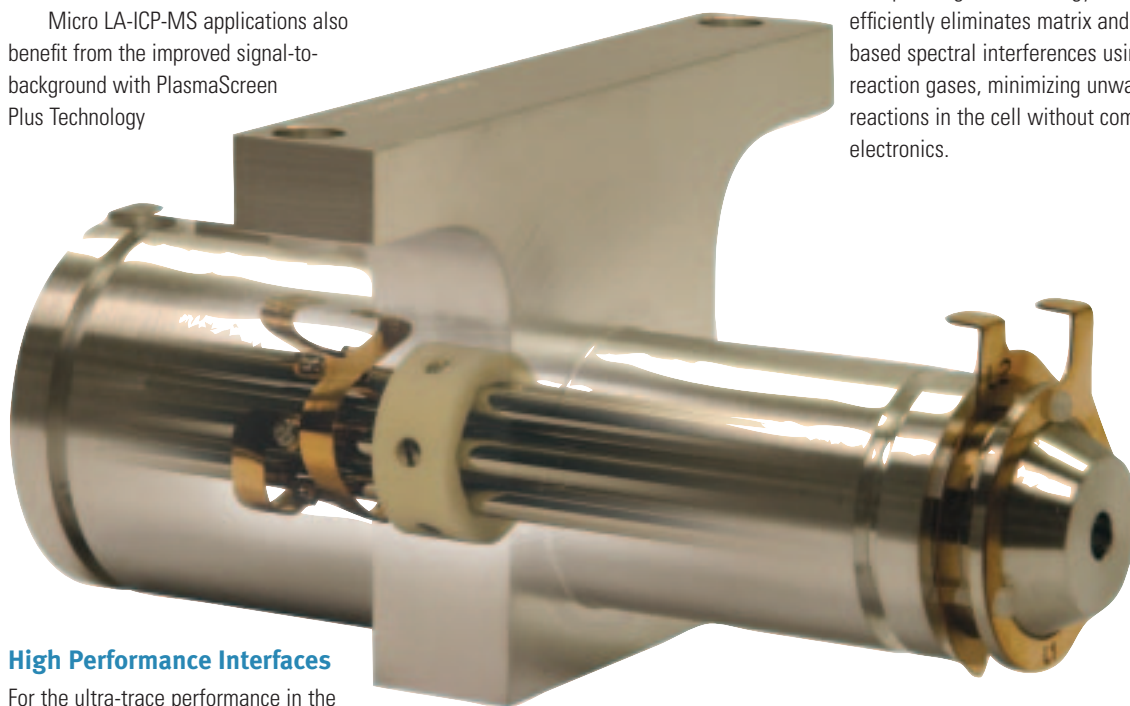
No Compromise Solution

A range of tailored options extends the X Series' performance and flexibility for the most demanding applications. These options provide a truly "no compromise" solution that is both feature-rich and dependable for long-term reliability.

PlasmaScreen™ Plus Technology

Gives sensitivity enhancement with both the standard Xi and HP interface option *without* compromising the instrument background. It is used with the Xi interface for improved hot plasma detection capability in both standard and CCT^{ED} measurement modes or with the HPI for enhanced cool plasma performance for ultra trace analysis of high purity matrices, giving sub-ppt detection of Li, Na, K, Ca & Fe.

Micro LA-ICP-MS applications also benefit from the improved signal-to-background with PlasmaScreen Plus Technology



High Performance Interfaces

For the ultra-trace performance in the analysis of semi-conductor reagents or other trace determinations such as the analysis of radionuclides or REEs in geological materials, high sensitivity interfaces can be fitted quickly and easily

Peltier-Cooled Spray Chamber

For applications requiring reduced solvent based interferences or the ability to handle organic matrices efficiently, the spray chamber can be cooled and precisely temperature-controlled by a Peltier device.

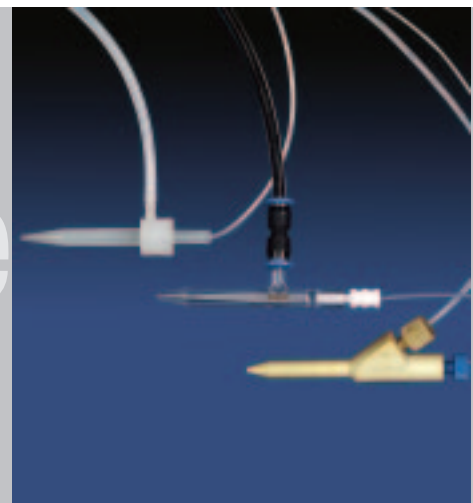
CCT^{ED}

Second-generation collision cell technology incorporating kinetic energy discrimination efficiently eliminates matrix and argon-based spectral interferences using simple reaction gases, minimizing unwanted side reactions in the cell without complex electronics.

Gas Control Modules

Up to 2 additional mass flow controllers can be fitted to improve organic matrix handling and /or enhance the use of high-performance, low-flow nebulizers.

Performance



Flexibility to exactly meet your requirements

Additional functionality and convenience features, as well as new and improved sample introduction systems, add value and even greater productivity to your X Series ICP-MS.

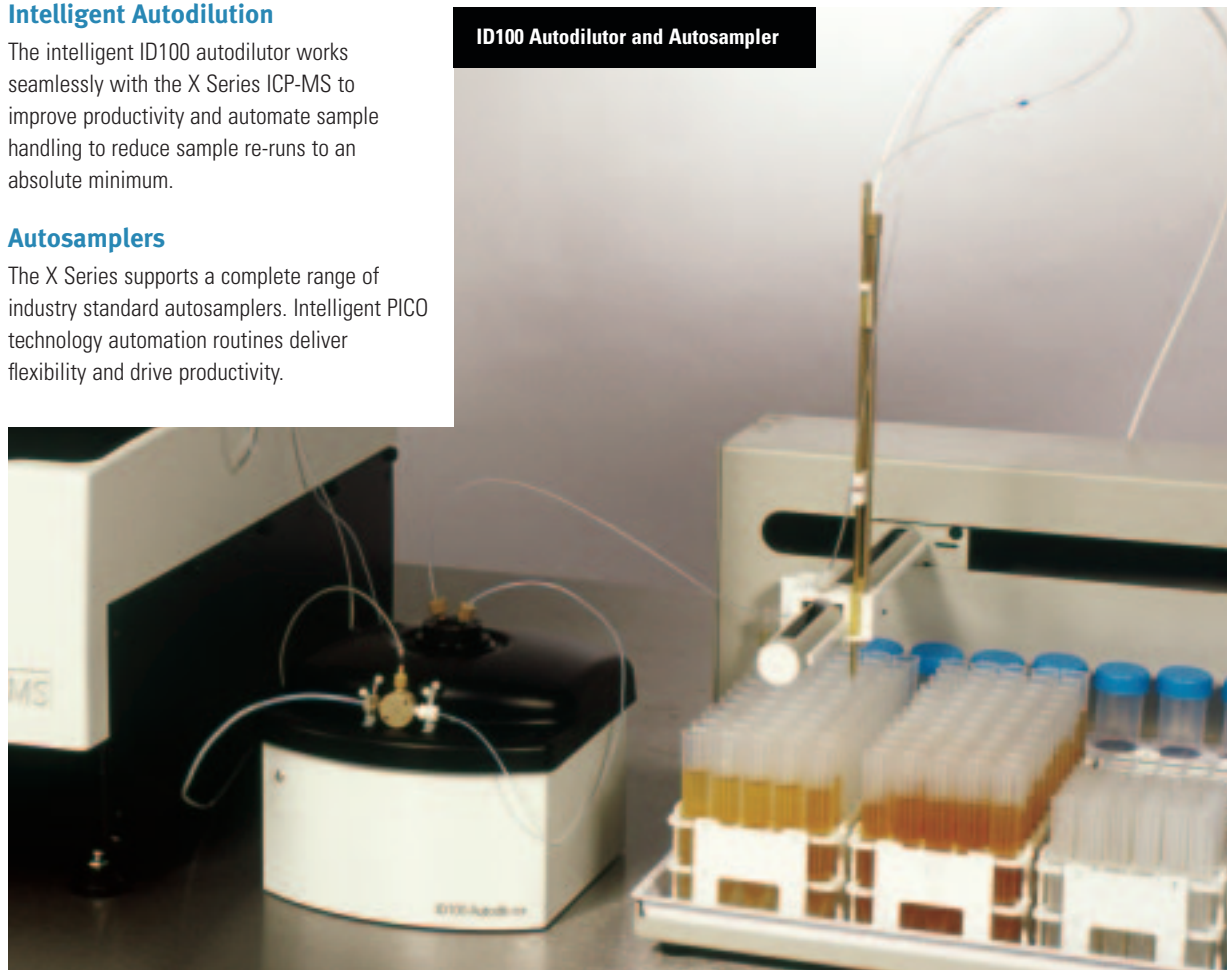
Intelligent Autodilution

The intelligent ID100 autodilutor works seamlessly with the X Series ICP-MS to improve productivity and automate sample handling to reduce sample re-runs to an absolute minimum.

Autosamplers

The X Series supports a complete range of industry standard autosamplers. Intelligent PICO technology automation routines deliver flexibility and drive productivity.

ID100 Autodilutor and Autosampler



Sample Introduction Systems

Configure the sample introduction system to suit your application needs from the range of nebulisers, spray chambers and ICP torches. Systems to cope with aggressive acids, high solids and ultra pure chemicals are available.

Chromatography integration & coupling

HPLC and GC coupling kits allow full control of a Thermo Electron or third party chromatographic system for totally integrated speciation measurements.

Integrated Laser Ablation Systems

Depending on your needs, a choice of fully integrated, easy-to-use laser ablation systems allow you to analyze solids directly, without sample preparation.

Finnigan Focus GC



Finnigan Surveyor™ HPLC



Microprobe UP Laser Ablation System



Services to suit your needs - wherever you are

X Series ICP-MS
Practicality, Productivity, Performance

Customer Training

To ensure that maximum productivity is achieved as quickly as possible Thermo Electron offers a range of operator training courses to cater for all levels of analyst experience:

Basic Operators Course

Ensures that ALL users get the maximum performance from the system by utilising the many features of the hardware and software to make the analysis more efficient.

Advanced Training Courses

Tailored courses focus on specific application areas (Environmental, Clinical, Geological & Nuclear) and equip users with the knowledge to develop new methods for the analysis of these sample types.

Protocol Compliance Assistance Courses

On-Site assistance with the initial implementation process to ensure laboratories achieve validation for regulatory compliance.

With Thermo Electron demonstration facilities and ICP-MS specialists located in all major countries you are never far from a quality assured X Series Training Course

Customer Support

A total elemental analysis solution requires more than advanced technology and quality products. It requires a high level of personal attention, applications support and on-site service.

This is one of the cornerstones of Thermo Electron: a company-wide commitment to helping customers realize maximum value for their investment in our products through responsive, accessible service and support.

Highly skilled local Service Engineers are certified through rigorous factory training courses before any instruments are delivered. A dedicated Support team based in the factory work to ensure that the highest levels of support and products are maintained and the web-based Customer Support forum gives 24 hour a day access to the latest information, software updates and consumables catalogues.

Upgrades

The specially designed X Series ICP-MS upgrade packages offer total flexibility to upgrade your system. Every upgrade has been custom designed and packaged to offer the simplest and quickest route to completion together with on site installation without compromising the existing performance of your X Series ICP-MS.

Support



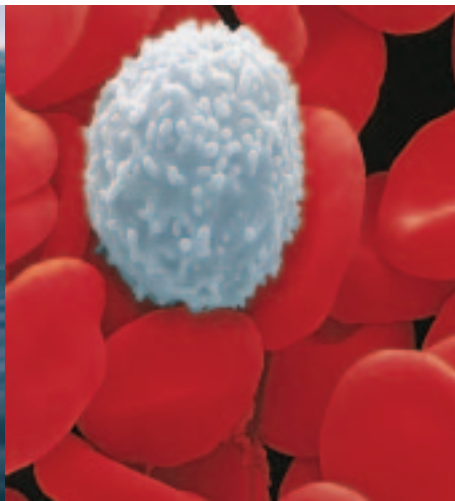
Available application-specific configurations

The X Series ICP-MS is designed to be a workhorse that even in its standard configuration can fulfil the needs of many protocols straight out of the box. For many

regulated applications, tailored productivity packs provide all that is required to get up and running billable samples within days of the instrument delivery. In addition, the

various instrument and sample introduction options can be selected to optimize the X Series for a diverse set of requirements.

Application sector	Typical requirement	Elements	Recommended instrument options	Recommended sample introduction options
Environmental	Drinking water	EPA 200.8, 98/83/EC	No options required	No options required
	Sludge and soil digests	EPA 6020A	No options required	Inert sample intro + Burgener Miramist nebuliser
	Bore hole or hard groundwaters	Group I & II, transition, toxic elements	Peltier	Burgener Miramist
	Sea water or brine	Transition metals, REEs, Th & U	Peltier and CCT ^{ED}	Burgener Miramist
	Nuclear pollution	Tc, Am, Pu, Np, U	Peltier	Ni High Performance Interface
Speciation	LC-ICP-MS	As, Cr, Sn etc	Peltier, CCT ^{ED} and Additional gas unit	LC coupling kit
	GC-ICP-MS	Hg, Sn, S, Cl	Additional gas unit	GC coupling kit
Biomedical	Blood	Cd, Hg, Pb	Peltier	Burgener Miramist nebuliser
	Urine	As, Cr, Hg	Peltier and CCT ^{ED}	Burgener Miramist nebuliser
	Serum	Al, Cu, Zn, Se	Peltier and CCT ^{ED}	Burgener Miramist nebuliser
	Biological tissue digests	All metals	Peltier and CCT ^{ED}	Burgener Miramist nebuliser
	Pharmaceutical compounds QA	All metals	Peltier and CCT ^{ED}	No options required
	Catalyst contamination	Pt group metals	Peltier and CCT ^{ED}	No options required
Semi-conductor	Process chemicals	SEMI specs.	Peltier, CCT ^{ED} and additional gas unit	Pt High Performance Interface, ESI PFA sample introduction
	Si wafer wash	SEMI specs.	Peltier, CCT ^{ED} and additional gas unit	Pt High Performance Interface, ESI PFA sample introduction
	Organic solvents and photo-resists	SEMI specs.	Peltier, CCT ^{ED} and additional gas unit	Pt High Performance Interface, ESI PFA sample introduction
Nuclear	Fuel production QA/QC	B, REEs	Peltier	Ni High Performance Interface
	Operator body fluid monitoring	U, Pu	Peltier	Burgener Miramist nebuliser and Ni High Performance Interface
	Isotope ratio studies	U	Peltier	Ni High Performance Interface
Geochemical	Groundwater and geochemical surveys	Li to U	Peltier	No options required
	Rock digests and lithium metabolate fusions	Li to U	Peltier	Burgener Miramist nebuliser
	Laser ablation ICP-MS	REEs	No options required	Ni High Performance Interface and Laser coupling kit



Plasma Capabilities from Thermo Electron

The use of an Inductively Coupled Plasma source (ICP) is the accepted and most powerful technique for the analysis and quantification of trace elements in both solid and liquid samples. Its applications range from routine environmental analyses to the materials industry, geological applications to clinical research and from the food industry to the semiconductor industry.

Thermo Electron Corporation is the only instrument manufacturer to offer the full range of Inductively Coupled Plasma Spectrometers (ICP-OES, Quadrupole and Sector ICP-MS) to satisfy every aspect of plasma spectrometry from routine to highly demanding research applications.

Develop your lab from the easy-to-use IRIS Intrepid II ICP-OES to the high performance X Series Quadrupole ICP-MS and up to the ultra-sophisticated Finnigan™ ELEMENT2 and Finnigan™ NEPTUNE Sector ICP-MS instruments. Each instrument combines leading-edge technology, fit for purpose and affordability with a tradition of quality, longevity, accuracy and ease of use.

IRIS Intrepid II



X Series ICP-MS



Finnigan ELEMENT2



Finnigan NEPTUNE



In addition to these offices, Thermo Electron Corporation maintains a network of representative organizations throughout the world.

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