Agilent 720/725 ICP-OES

RELIABLE. PRODUCTIVE. ROBUST.

The Measure of Confidence

Agilent Technologies

The world's best ICP-OES

The Agilent 720/725 ICP-OES offer the finest performance, speed and reliability. At the heart of these instruments is the next generation VistaChip II, a custom designed, hermetically sealed CCD detector, giving you unrivaled productivity. With a range of performance enhancing options and a powerful software platform, the 720/725 will meet your most demanding needs — now and in the future.

The Agilent 720/725 ICP-OES systems are the world's most productive high-performance and only truly simultaneous ICP-OES.

- **Reliable** – Continuous wavelength coverage provides the ability to select multiple wavelengths for a given element, thereby extending dynamic range and avoiding interferences, giving you maximum confidence in your results.
- **Productive** – One view, one step measurement of major, minor, and trace elements, plus the fastest warm-up, increases throughput and productivity.
- **Robust** – Exceptionally robust plasma ensures reliable and reproducible results, even with the most complex matrices.
- **Cost-effective** – With a sealed CCD detector that requires no purging, a compact optical system, and an efficient RF system that sustains an analytical plasma at lower argon flows, the Agilent 720/725 lower gas usage and operating costs.
- **Flexible** – Choice of optimized axial (720) or radial (725) configurations to suit your application needs.
- **Intuitive** – Superior software features providing automation and ease-of-use.

The Agilent 720/725 ICP-OES feature a custom-designed proprietary CCD detector, delivering the world's most productive, high-performance ICP-OES platform.

Robust enough for complex samples

With over 7,000 ICP-OES systems worldwide, Agilent's plasma generation system is field-proven, exceptionally robust, and consistently provides stable and accurate results, even with the most challenging samples such as high salts, brines, dissolved solids and complex organics.

The innovative Cooled Cone Interface (CCI) of the Agilent 720 ICP-OES removes the cooler tail of the plasma, increasing the linear dynamic range and reducing sample matrix-related interferences. The superior design of CCI eliminates the need for dual-view optics and expensive shear gases, saving you time and money.

Designed for speed and accuracy

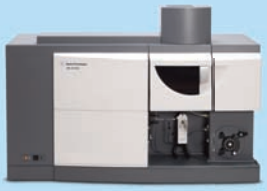
The VistaChip II CCD detector sets the benchmark for speed and performance. The VistaChip II is optimized to exactly match the optical image produced by the echelle optics, requiring only 70,000 photosensitive pixels to provide complete wavelength coverage from 167–785 nm.

Powerful and reliable software

ICP Expert II software complements the power of the VistaChip II detector technology, featuring a range of Agilent exclusive software features:

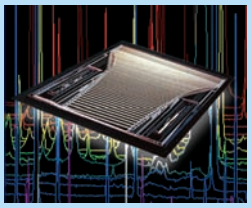
- Fitted Background Correction (FBC)
- AutoMax auto-optimization
- Smart Rinse
- Fast Automated Curve-fitting Technique (FACT)
- MultiCal
- Semi-quantitative analysis
- Time Resolved Spectroscopy (TRS) for speciation applications

Remarkably better innovations

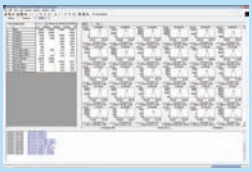


Agilent 720 ICP-OES
The Agilent 720 with axially-viewed plasma provides exceptionally low detection limit performance. Featuring CCI, the Agilent 720 is perfectly suited to environmental, food, agriculture and industrial applications.

Agilent 725 ICP-OES
The Agilent 725 with radially-viewed plasma is the instrument of choice for routine analysis of difficult samples. The higher matrix tolerance of the vertically-oriented plasma has made it the industry standard for metals, mining and petrochemical applications.



True simultaneous performance
Featuring Adaptive Integration Technology, the VistaChip II provides true simultaneous measurement of all elements from parts-per-billion to percent levels in a single measurement, making it the most productive ICP-OES in the world.



Remarkably better software
With a familiar worksheet interface, automated method development, and wizards and videos to guide you, the Agilent ICP Expert II software saves you time. View analysis results instantly for easy data review and handling.

AGILENT TECHNOLOGIES

MAXIMUM PERFORMANCE

Agilent 720 ICP-OES — productivity with extended dynamic range

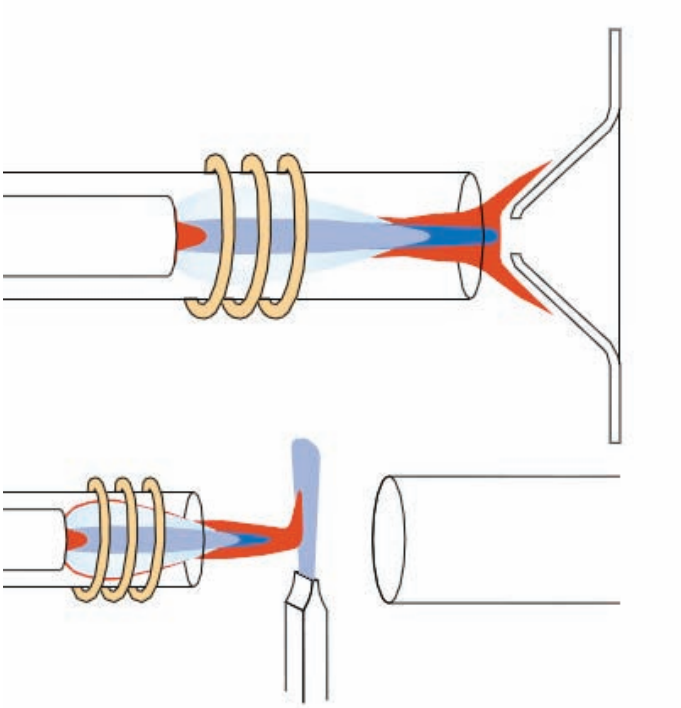
Agilent's 720 horizontally-oriented, axially-viewed plasma provides excellent sensitivity for trace-level determinations and the flexibility to handle major levels. The robust plasma is able to analyze a wide variety of sample matrices while still delivering the best detection limits. Agilent's unique MultiCal feature extends the linear range of an analyte from parts-per-billion to percentage levels. Unlike dual-view systems, the Agilent 720 ICP-OES provides this linear dynamic range without having to analyze the sample twice.

The 720 ICP-OES is ideal for the analysis of waters and wastes, soils and sediments, foods, beverages and agricultural samples, and is capable of measuring elements from trace to major levels simultaneously, with one plasma view.

Agilent 725 ICP-OES — robust performance for difficult samples

If long-term analysis of the most difficult sample types is required, then Agilent's 725 offers the benefits of robust operation with minimal maintenance. The Agilent 725 radially-viewed plasma is vertically oriented, making it more tolerant to difficult matrices. The 725 provides long term stable performance even with high levels of dissolved salts or solids. Dual-view plasma systems, which feature horizontal torches, cannot match the rugged, high solids performance of the 725.

The robustness of the 725 makes it ideal for applications common to mining, chemicals manufacture, salt production, wear metals analysis, petrochemical production and precious metal refining.



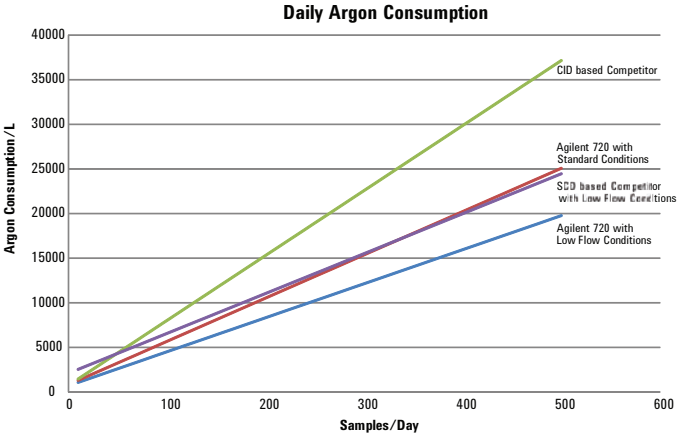
One-step analysis from one plasma view. Agilent's CCI for the 720 ICP-OES efficiently removes the cool plasma tail (the red zone, top) away from the optical path. This minimizes self-absorption and recombination interferences to provide a wide linear dynamic range, reduced matrix interferences and low background for the best detection limits.

Dual-view plasmas (bottom) either use a high-flow shear gas to ineffectively 'blow away' the plasma tail from the optical path or do not remove the plasma tail at all, instead taking a second measurement, side-on to the plasma. This adds complexity, and increases analysis times, argon usage and running costs.

Lowest operating costs

The Agilent 720/725 ICP-OES offer a full suite of productivity enhancements to reduce operating costs and provide the throughput you need.

- With a sealed CCD detector that requires no purging, a compact optical system, and an efficient RF system that sustains an analytical plasma at lower argon flows, the Agilent 720/725 lower gas usage and operating costs.
- Option of three- or five-channel pump for online addition of internal standards and simultaneous measurement of hydride and non-hydride elements.
- Mass flow controlled nebulizer gas eases method development and provides fully automated operation.



Because of its fast sample throughput, low optical purge and sealed CCD detector, the Agilent 720 ICP-OES uses 20– 40% less argon than rival systems in low flow mode. For challenging samples requiring higher argon plasma flow, the Agilent 720 will economically deliver accurate, interference-free results not possible with low flow conditions.

Options for every application

Choose from a range of sample introduction options, including plasma torches, nebulizers, spraychambers and tubing to suit your specific application requirements:

- Maximum sensitivity option for environmental, food and agricultural samples
- Petrochemical option for the analysis of organic and volatile organic solvents
- Inert sample introduction kits for samples containing hydrofluoric acid (HF)
- Robust system for chemicals and other high dissolved solid samples
- High precision option for metals and precious metals

Performance enhancing accessories

The Agilent 720/725 ICP-OES feature a variety of accessories to further extend their capabilities.

MSIS
The Multi-mode Sample Introduction System (MSIS) provides simultaneous measurement of hydride and non-hydride elements including As, Se, and Hg to sub-ppb detection limits. The MSIS offers a choice of three modes that eliminate changeover and allow routine and hydride elements to be determined using the same setup.

SVS 2
More than double the productivity of your 720/725 ICP-OES with the SVS 2 switching valve system. By reducing uptake, stabilization and rinse delays, the SVS 2 substantially reduces sample-to-sample cycle time.

SPS 3
Automate and simplify analysis with the Agilent SPS 3 sample preparation system. With the fastest operation, extended sample capacity via rack changes, and a flexible choice of racks, simply load, set, and go.

OneNeb
Exclusive to Agilent, the OneNeb nebulizer is designed to handle challenging samples. The inert polymer construction is resistant to organic solvents and strong acids, while the virtually unblockable design makes it ideal for samples containing high dissolved solids.

Sheath gas torch
Reduce salt build-up in the torch injector when analyzing high dissolved solid samples with the sheath gas torch, which further improves long term stability and reduces maintenance.

THE WORLD'S MOST PRODUCTIVE ICP-OES

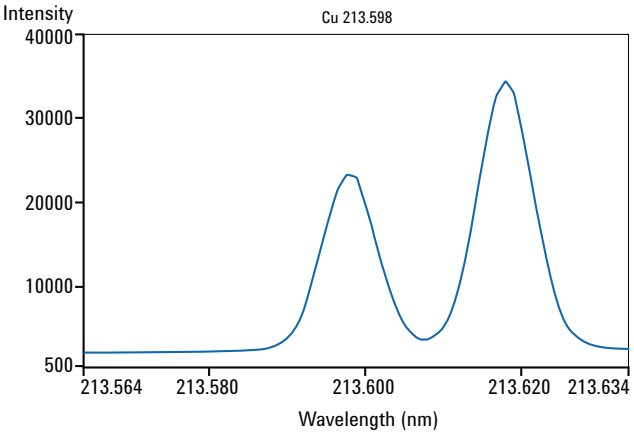
True simultaneous measurement

The Agilent 720/725 ICP-OES are the only true simultaneous ICP-OES with full wavelength coverage. The 720/725 ICP-OES use an echelle polychromator to separate and focus analyte emission lines generated in the plasma onto a detector for measurement. Unlike competitive systems, the optical design is optimized to provide complete wavelength coverage without the need for multiple detectors or multiple entrance slits. True simultaneous ICP-OES delivers superior performance, providing unmatched analysis speed, precision and accuracy.

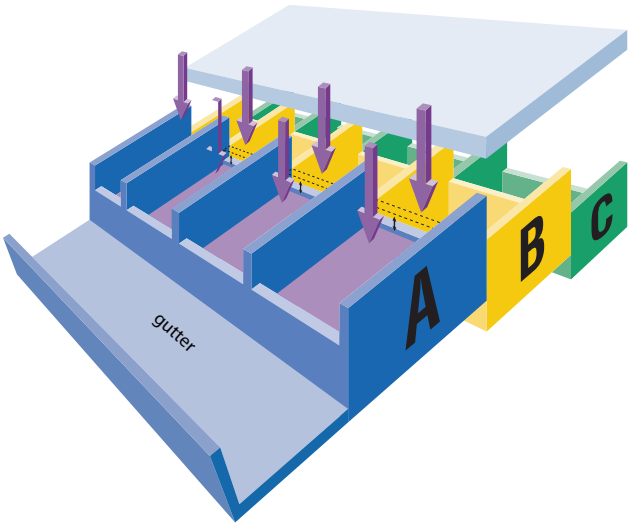
Setting the benchmark in performance

The sealed CCD detector provides full wavelength coverage and fast read-out for maximum flexibility and productivity.

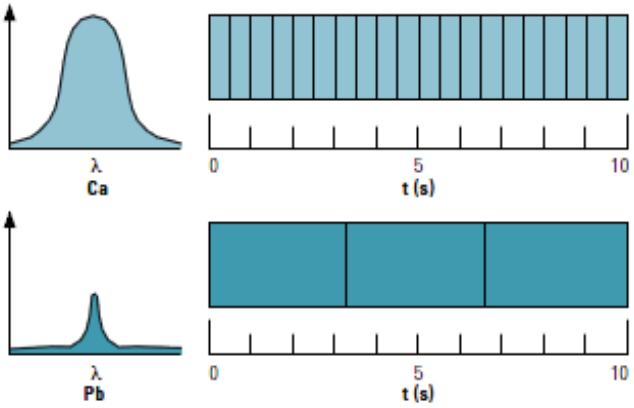
- Adaptive Integration Technology (AIT) prevents over-range signals by adjusting the measurement time simultaneously for each wavelength to achieve the optimum signal-to-noise ratio. AIT ensures all elements are always measured at the same time, irrespective of their concentration or emission line intensity.
- Image Mapping Technology (I-MAP) ensures complete coverage of all wavelengths by arranging 70,000 pixels in an uninterrupted array that exactly matches the two-dimensional echelle optical image. This ensures complete wavelength coverage from 167–785 nm and eliminates the need for separate sequential measurements.
- Temperature controlled optics and the hermetically sealed VistaChip II CCD detector provide excellent stability. An exceptionally fast warm up time allows you to start analyzing samples quickly.
- The higher diffraction orders of the echelle polychromator, combined with the best detector pixel resolution of the 720/725 ICP-OES, offer superior resolving power.



With an optical resolution of <8 pm and pixel resolution of 3 pm, the peaks of Cu 213.598 nm and P 213.618 nm are easily identifiable.



Unlike other CCD detectors, the VistaChip II features anti-blooming protection on every pixel. If during a reading an intense signal saturates a pixel (a), the excess electrons drain into the gutter rather than into nearby pixels or the other registers (b and c), allowing simultaneous measurement of trace analytes in the presence of concentrated elements.



For a replicate time of 10 seconds, AIT simultaneously collects many short readings for high intensity lines, and fewer, longer readings for low intensity lines, providing the best signal-to-noise ratio and true simultaneous analysis.

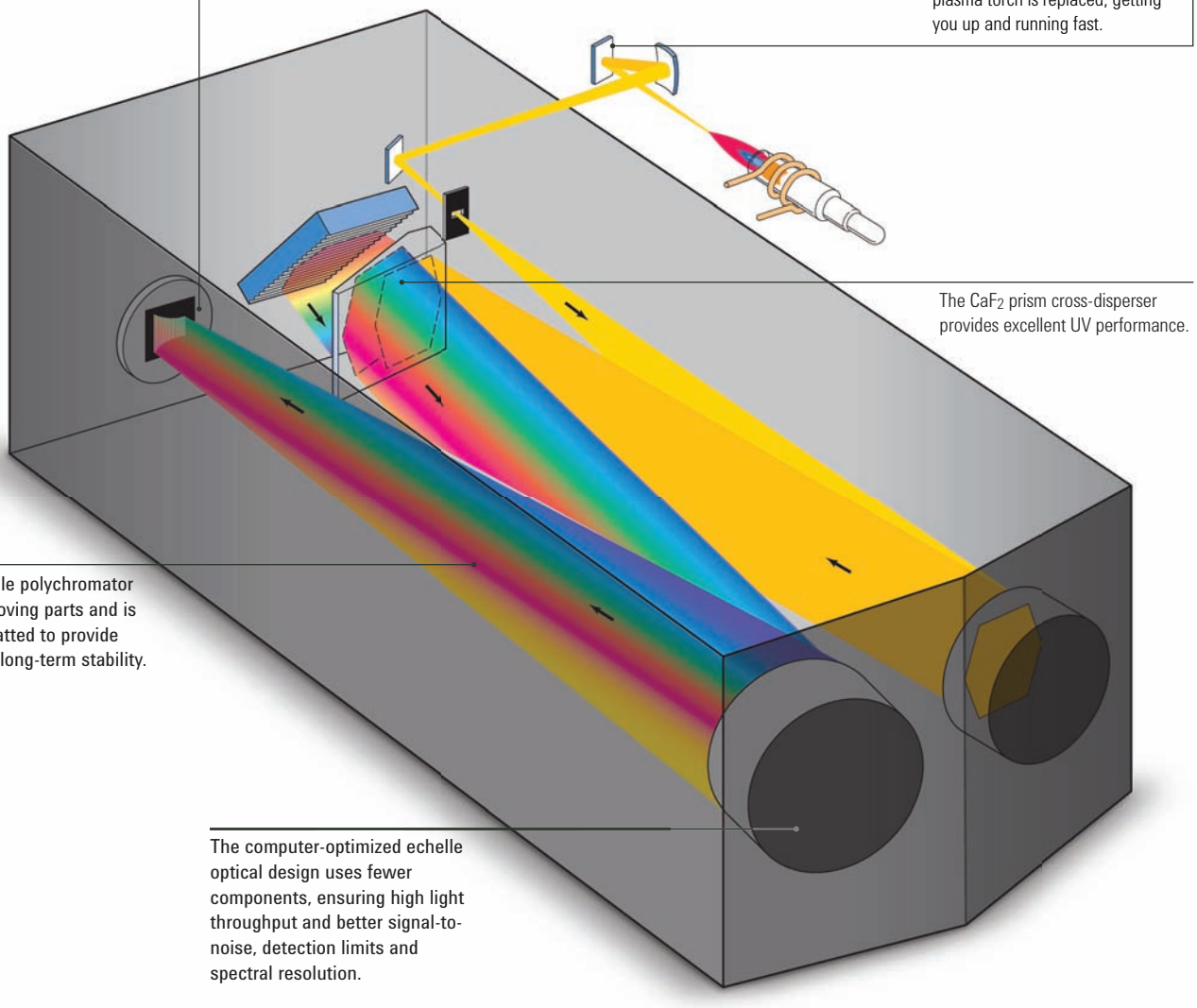
THE WORLD'S MOST PRODUCTIVE ICP-OES

The 720/725 provide true simultaneous measurement of all analytes, background and internal standards. Intelligent no-compromise system design means that all wavelengths are captured in one fast, efficient reading, eliminating the need for multiple detectors, slits, or multiple plasma views.

The proprietary VistaChip II CCD detector provides anti-blooming protection on every pixel, ensuring trace analytes can be accurately measured in the presence of high concentrations of other elements.

The hermetically-sealed VistaChip II requires no purging, reducing argon consumption and instrument warm-up time.

Computer controlled mirror enables the plasma viewing position to be automatically optimized when the plasma torch is replaced, getting you up and running fast.



The CaF_2 prism cross-disperser provides excellent UV performance.

The echelle polychromator has no moving parts and is thermostatted to provide excellent long-term stability.

The computer-optimized echelle optical design uses fewer components, ensuring high light throughput and better signal-to-noise, detection limits and spectral resolution.

AGILENT TECHNOLOGIES

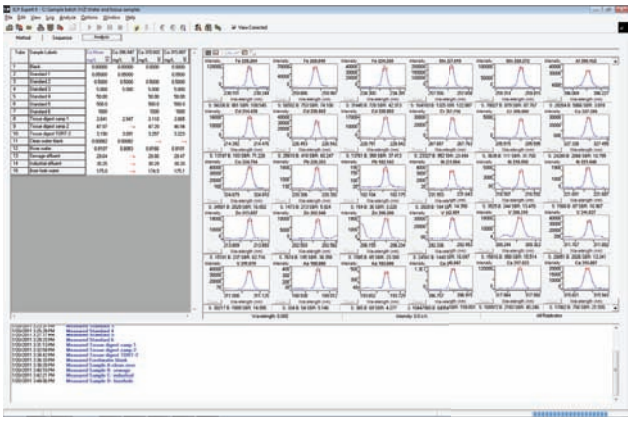
REMARKABLY BETTER SOFTWARE

Simplify your workflow

The intuitive and user friendly ICP Expert II software has all instrument controls, sample results and signal graphics accessible from one window.

Software designed for real samples

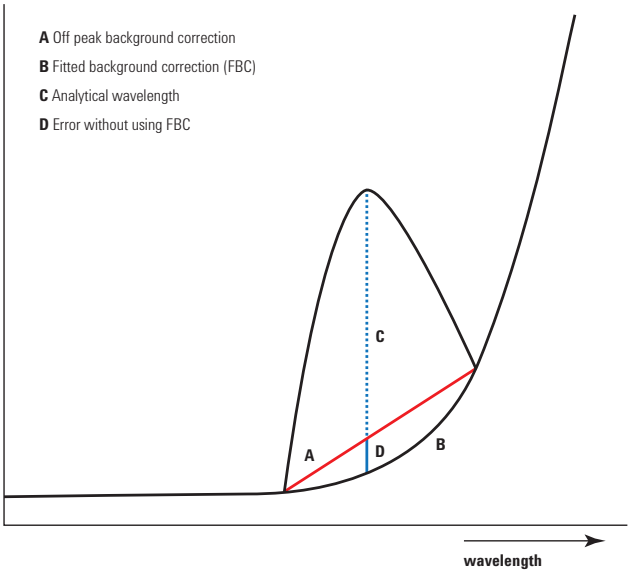
- Easy-to-use worksheet-based software contains wizards and comprehensive multimedia tools to guide you through operation.
- Fitted Background Correction (FBC) simplifies method development, eliminating the need to select correction points. This ensures better correction and fast analysis start-up.
- Agilent's Fast Automated Curve-fitting Technique (FACT) resolves complex spectral interferences, ensuring greater accuracy in difficult matrices. FACT modeling can be conducted post-analysis.
- AutoMax eliminates manual optimization and provides fast automated method development.
- Smart Rinse speeds up sample washout, reducing carryover and increasing productivity.
- Spectroscopy Configuration Manager software assists you to achieve compliance with the US FDA 21 CFR part 11 rule (optional).
- MultiCal allows you to monitor results at two or more wavelengths for each element — giving you confidence in the accuracy of your results and extending your measurement range.
- Time resolved signal mode enables you to couple the Agilent 720/725 to a HPLC or Laser Ablation for fast, multi-element speciation and qualitative applications.
- Measure the full Echelle spectrum in less than 1 second to quickly identify elements in unknown samples.
- Collect the spectral data of all elements in your samples without increasing analysis times for retrospective, semi-quantitative capability.



Accurate, automatic background correction

FBC is a unique, powerful, yet easy-to-use background correction technique that uses a sophisticated mathematical algorithm to model the background signal under the analyte peak.

- Accurate correction of both simple and complex background structures.
- No method development required.
- No need to search for suitable off-peak background correction points for different sample types.

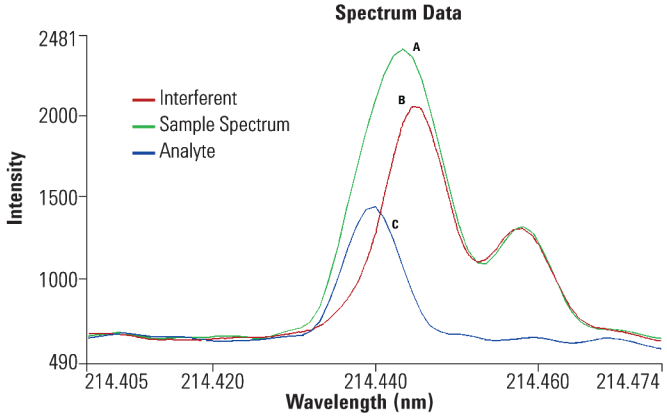


Accurate, automatic background correction with FBC
FBC calculates the true background signal, improving accuracy and saving time during method development.

FACT spectral deconvolution

FACT provides real-time spectral correction by using an advanced spectral modeling technique to mathematically separate the analyte signal from the raw spectrum.

- Analyze spectrally complex samples with confidence.
- Use the FACT wizard to create spectrally pure models of the background, analyte and interferent signals in three simple steps.
- FACT models can be applied post-analysis and stored for future analyses.



Resolve spectral interference with FACT
Resolution of the difficult Fe interference at Cd 214.438 nm. Shown are:
A. Appearance of the peaks in a soil sample, B. FACT model of the interference,
C. Corrected signal for the Cd analyte.

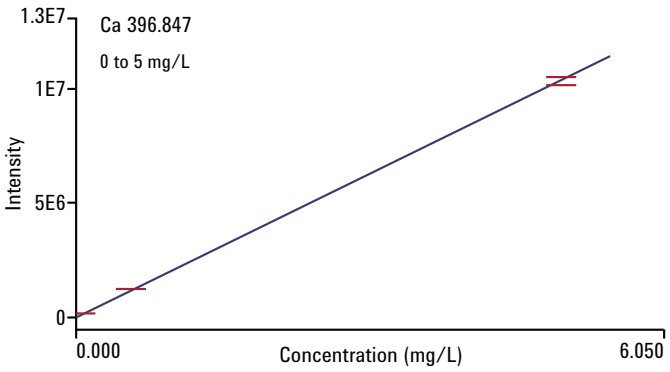
MultiCal extends linear dynamic range

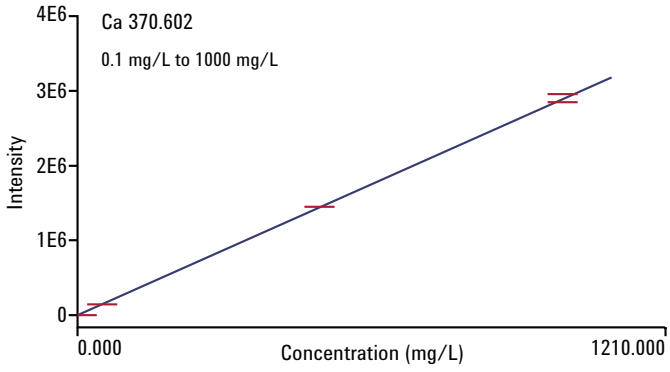
MultiCal uses the full wavelength coverage and truly simultaneous measurement capability of the 720/725 ICP-OES to extend linear dynamic range far beyond dual-view systems — *with no time penalty*.

- Combine element wavelengths with different sensitivities to extend linear dynamic range an additional three orders of magnitude.
- Monitor results at two or more wavelengths for each element and increase accuracy by confirming they are interference-free.
- Select the appropriate calibration for the analyzed sample, for fast, accurate measurement from trace to major levels in a single analysis.
- Dual view systems offering limited wavelength selection only provide a one order of magnitude increase in linear dynamic range and require a separate measurement to do so — increasing analysis time and running costs.

MultiCal in action

Sample Labels	Ca Mean mg/L	Ca 396.847 mg/L	Ca 315.887 mg/L	Ca 370.602 mg/L
Clean water blank	0.00082	0.00082	-	-
River water	0.811	0.805	0.810	0.817
Sewage effluent	29.64	-	29.47	29.80
Industrial effluent	30.25	-	30.20	30.29
Bore hole water	175.0	-	175.1	174.9





Extend linear dynamic range and confirm results automatically with MultiCal
Combine the sensitive Ca 396 nm and less sensitive Ca 370 nm emissions lines to extend the linear dynamic range over 7 orders of magnitude. Combine the Ca 396 nm, Ca 315 nm and Ca 370 nm emission lines and confirm your results are free from interference.

For your application

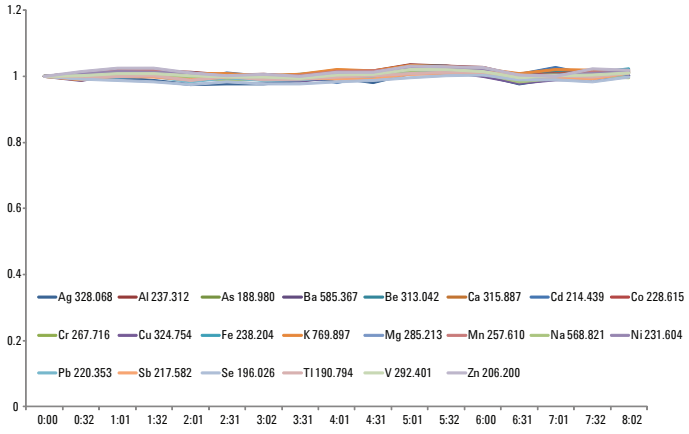
Agilent is committed to providing solutions for your application. We have the technology, platforms, and expert guidance you need to be successful.

					
720/725 ICP-OES	Pb and Cd in consumer goods such as toys, jewelry and clothing N/P/K, S/Ca/Mg and micronutrients in fertilizers Major, minor and trace elements in brines Metal impurities in pure hydroxides and salts	S, P, Ca, Mg, Na, and K in biodiesel (ASTM D6751 & EN 14214) S, P and Cu in ethanol for blending with fuel (EN 15837) Additive elements, wear metals and contaminants in used lubricating oils (ASTM D5185) Major elements in polymers	Toxic elements in waters, soils and sediments (US EPA Method ILM05.3) Metals and trace elements in waters and wastes (US EPA Method 200.7) Heavy metals in soils Pb, Cd and Cr in electronics and plastics (WEEE/RoHS) Metals in aqueous wastes containing oils, greases or waxes (US EPA Method 3040A) Trace elements in waters and wastes (US EPA Method 6010)	Major, minor and trace elements in foods, beverages and agricultural samples Elemental impurities in pharmaceuticals (USP 232, 233) Extractable cations and nutrients in soils	Trace impurities in high purity Cu Au, Ag and Pt group elements in ore grade material Major and minor components in iron, steel and alloys Trace elements in geological samples

Environmental, Food and Agriculture

In fields that demand accuracy, productivity and regulatory compliance, your challenges have never been greater. Today, environmental, food and agricultural analysis must be done more reliably, more efficiently, and with even higher quality results than ever before.

- The axially-viewed 720 is optimized to give maximum sensitivity for trace-level applications, including the determination of trace and toxic elements in soils and waters and the determination of major, trace and toxic elements in food and agricultural samples.
- MultiCal feature extends the linear range of analysis from parts-per-billion to percentage levels, providing the dynamic range needed for simultaneous determinations using one plasma view.
- The thermally stabilized optics contain no moving parts, ensuring excellent long-term stability so you can satisfy all the required regulatory limits without recalibration.
- The ICP Expert II software provides complete automation of all US EPA protocols. Customizable QC tests enable you to satisfy the requirements of other regulatory bodies.
- Double productivity and reduce argon consumption by 50% with the SVS 2 switching valve system.



Excellent long term stability

Shown is US EPA CLP ILMO 5.3, Continuing Calibration Verification (CCV) solution achieving <1% RSD repeatability for all elements over 8 hours, without internal standardization.

Metals and mining

Whether your challenge is determining traces in the presence of spectrally complex elements such as iron and precious metals which may induce spectral interferences, determining analytes from trace to percentage levels, or handling digests with high levels of dissolved solids, the 725 delivers.

- The radially-viewed 725 features an efficient sample introduction system for maximum robustness, allowing you to analyze the most demanding samples with ease and accuracy.
- Full wavelength coverage and high resolution optics provide flexibility in wavelength selection so that you can optimize signal-to-noise and eliminate spectral interferences.
- Agilent's unique MultiCal feature extends the linear range by monitoring your results at two or more wavelengths, providing the dynamic range needed to cover mineralogical samples.
- ICP Expert II software provides the correction options essential for accurate results. Choose from FBC to handle changing baselines, FACT for fast and easy removal of spectral interferences or more traditional inter-element correction.

Industrial, Chemical and Petrochemical

Production demands, efficiency improvements, and good environmental management impose increasingly tough demands on your business. Agilent understands your success depends on fast, accurate results from rugged, reliable instrumentation that can handle difficult sample types.

- Agilent's plasma generation system is exceptionally robust, and consistently provides stable and accurate results, even with the most challenging samples such as high salts, brines, dissolved solids and complex organics.
- High resolution echelle optics minimize spectral interferences that can occur in complex chemical matrices.
- ICP Expert software provides correction techniques such as FBC, FACT or even traditional inter-element corrections essential for accurate results.
- Optional inert sample introduction system for samples containing hydrofluoric acid (HF).
- Optional robust axial and radial sample introduction systems for chemicals, organic solvents and high dissolved solid samples.

Agilent's Atomic Spectroscopy Portfolio: New technologies, more possibilities

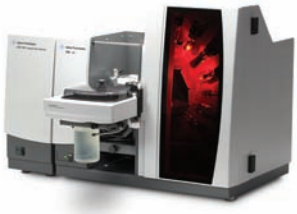
Agilent has changed the atomic spectroscopy landscape. Remarkable innovations like the ICP-QQQ and MP-AES have added even more application opportunities to those already offered by Agilent ICP-MS, ICP-OES, and AA solutions.

Agilent's 8800 Triple Quadrupole ICP-MS transforms ICP-MS technology, providing applications capabilities and research opportunities never possible before.

Agilent's 7700 Series ICP-MS offers unmatched matrix tolerance and interference removal, and the smallest size of any single quadrupole ICP-MS.

Agilent's 700 Series ICP-OES is the world's most productive high performance simultaneous ICP-OES.

The revolutionary **Agilent 4100 MP-AES** runs on air for lowest cost of ownership and improved safety.



Agilent's AA range includes the world's fastest flame AA and the world's most sensitive furnace AA.

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Maximize your productivity and data quality with genuine Agilent parts and supplies

From our ICP torch, through to our range of nebulizers and spraychambers optimized for your application – Agilent ICP-OES parts and supplies are manufactured to our tight tolerances and stringent specifications. They are also rigorously tested to ensure that you'll always get the best performance from your instrument and the best results for your clients.

Trust Agilent to keep your lab running at peak productivity

Agilent's Advantage Service protects your investment in Agilent instruments and connects you with our global network of experienced professionals who can help you get the highest performance from every system in your lab. Count on us for the services you need at every stage of your instrument's life – from installation and upgrade to operation, maintenance and repair.

For customers who require full system validation, Agilent offers complete qualification services for the 720/725 ICP-OES.

And if ever your Agilent instrument requires service while covered by an Agilent service agreement, we guarantee repair or we will replace your instrument for free. No other manufacturer or service provider offers this level of commitment.

Agilent Technologies