

ICP-Optical Emission
Spectroscopy**Key Features**

- CCD array detector delivers flexibility and speed
- Exceptional reliability with a solid-state RF generator
- Dual-view optical system ensures the widest working range and excellent detection limits
- Auto-integration by Element dramatically improves sample throughput
- Versatile wavelength selection for analysis flexibility
- Dynamic Wavelength Stabilization eliminates peak profiling and searching, ensuring exceptional long-term stability
- Enhanced sample throughput and performance with simultaneous background correction

Optima 7000 DV ICP-OES

The Optima™ 7000 DV ICP-OES system brings advanced technology to laboratories requiring flexibility and excellent analytical performance for varied and moderate sample loads. The CCD array detector allows you to collect a complete analyte spectrum at speeds that far exceed competitive systems. Automatic dual viewing ensures the lowest detection limits and the widest working ranges. The Optima 7000 DV is the ideal solution for research and quality assurance laboratories that have a wide variety of samples and lower frequency of analysis.

The custom-designed solid-state CCD array detector, the solid-state RF power supply, and the purged optical system provide both superior performance-measurement stability and enhanced reliability. This reduces operating costs and ensures your instrument is available when needed. Computer-controlled gas flows and mass-flow control of the nebulizer gas ensure day-to-day reproducibility.

The Optima 7000 DV is significantly different from other ICP instruments. With the power and reliability found only in high-end simultaneous research systems and the flexibility inherent to traditional systems, the Optima 7000 DV ICP-OES is ready for the demands of the 21st century.

Improved productivity

Auto-integration by Element is a productivity-maximizing feature in the Optima 7000 DV design. It significantly reduces analysis times through measurement-algorithm enhancements. This feature allows the analyst to select integration times for individual wavelengths on a method-specific basis. The result is very short analysis times for elements that have high concentrations, and longer analysis times for elements where detection limits are critical.

Dual-view design

The Optima 7000 DV spectrometer uses the PerkinElmer® patented dual-view optical system. Dual viewing allows automatic switching between very sensitive axial viewing to the greater dynamic range of radial viewing in the same sample, with no special adjustments. This eliminates the need to search for alternative wavelengths which is required on single-view instruments.

Rugged, reliable power

The Optima 7000 DV system features a solid-state RF power supply, providing exceptional ruggedness and reliability, eliminating the need for costly power tubes. Solid-state design makes the instrument exceptionally compact, minimizing lab space requirements.

Widest working range

Single method-controlled dual viewing of the plasma delivers the widest working range possible, providing the lowest detection limits and the greatest concentration range in a single system. Axial viewing allows ultratrace measurements because it provides a longer emission path for increased sensitivity and lower background levels. At the same time, radial viewing permits percentage concentration measurements. With the Optima 7000 DV ICP-OES, ultratrace and percentage concentration levels can be automatically determined in the same run without having to search through lists of alternative wavelengths.

Shear gas advantage

To eliminate interferences caused by the cooler regions in the plasma gas, the Optima 7000 DV ICP-OES uses a unique compressed-air shear gas system to remove the cool tail plume of the plasma. This provides a maintenance-free, reliable system compared to other methods, which use expensive argon gas and water cooling, as well as cones that may clog and require cleaning.

Accurate and reliable

The Optima 7000 DV system features a high-speed, high-resolution double monochromator with a simultaneous CCD array detector. High resolution yields reduced interferences and improved accuracy. Limited component movement and Dynamic Wavelength Stabilization™ (DWS) ensure exceptional wavelength accuracy and reliability. With the optical system's superior light throughput and the unmatched quantum efficiency of the solid-state detector, the Optima 7000 DV ICP-OES provides exceptional detection limits quickly and routinely.

Exceptional stability

An environmentally stable sample compartment and Dynamic Wavelength Stabilization deliver exceptional stability, eliminating the drift commonly experienced with other systems. That stability ensures reproducible performance, sample after sample, day after day. Consistent operation also allows the Optima 7000 DV ICP-OES to perform inter-element corrections and multi-component spectral fitting (MSF), techniques that provide superior analytical accuracy. For challenging laboratory environments, an optional sample-compartment thermostat is available.

Table 1. Typical Optima 7000 DV ICP-OES detection limits in µg/L (ppb) based on three standard deviations. All values were obtained using axial viewing, a GemCone™ nebulizer and cyclonic spray chamber, and a 10-second integration.

Element	Wavelength (nm)	D.L.
Al	396.152	0.9
As	193.696	3.6
B	249.772	0.25
Be	313.107	0.017
Cd	214.440	0.07
Co	238.892	0.25
Cr	267.716	0.25
Cu	224.700	0.9
Fe	259.939	0.2
Mn	257.610	0.03
Mo	202.031	2
Ni	231.604	0.4
Pb	220.353	1.4
Sb	206.836	4
Se	196.026	4.5
Tl	190.801	3.5
V	309.310	0.15
Zn	206.200	0.2

Unmatched speed

Outdated competitive ICP systems typically measure one wavelength at a time. The unique Optima 7000 CCD array measures the wavelength range around the emission line of interest simultaneously. This significantly reduces analysis time without sacrificing the flexibility inherent in full-wavelength capable systems. It also allows the Optima 7000 DV ICP-OES to perform background-correction measurements simultaneously with the measurement at the emission line, improving measurement accuracy and enhancing analysis speed. Add in the time saved using the broad concentration-range coverage made possible by automatic dual viewing of the plasma, and you have an ICP-OES system that analyzes all of your samples at previously unheard-of speeds.

Sampling simplicity

The Optima 7000 DV ICP-OES offers you a choice of easy-to-maintain sample-introduction systems. The durable HF-resistant spray chamber accommodates most matrices. For optimum performance in water matrices, use the cyclonic spray chamber and concentric nebulizer. Both systems are based on a snap-in-place cassette with real-time adjustments for the ultimate in sampling flexibility.

Superior analytical results

Even if you don't need to reach the ultratrace detection limits that the Optima 7000 DV ICP-OES can provide, its power translates into improved precision and accuracy, supplying clearly superior analytical results. Plus, you can be assured that if your requirements change, you have a system that has the ability to grow with you.

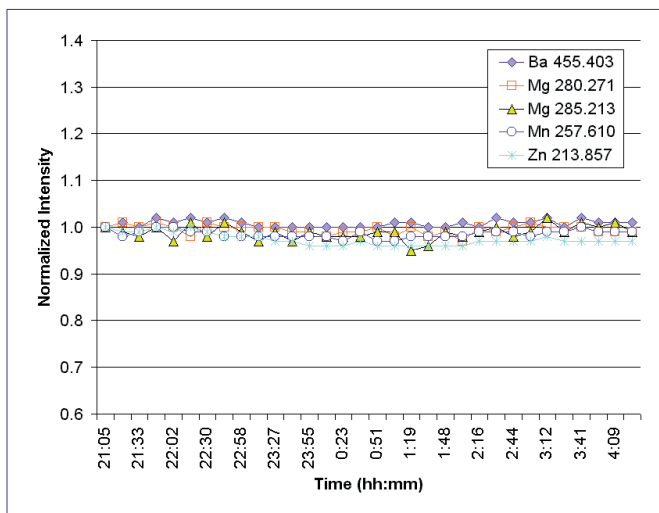


Figure 1. Typical long-term (8-hour) stability for the Optima 7000 DV ICP-OES – long-term stability gives higher lab productivity and better analytical performance.

WinLab32 software control

Full-featured WinLab32™ software is easy to learn and use and provides unmatched features and flexibility. Operating under the Microsoft® Windows® operating systems, WinLab32 gives you the tools you need to analyze your samples, report and archive data and ensure regulatory compliance.

WinLab32 offers a range of customer-driven enhancements:

New methods of addition

Users can now perform standard-additions calculations by simply selecting the equation they wish to use. Both method of additions calibration as well as the classic standard additions calibrations are possible.

Programmable “over calibration” message

Users can set an “over calibration limit” and specify whether or not “over calibration” messages are displayed when samples are run.

“Reprint original data” function

Allows users to create a verbatim copy of their original printout – ideal for regulatory environments (or other audit situations) when data needs to be presented exactly the same.

Flexibility during autosampler runs

By simply clicking on the “Append Method” button, users can dynamically add to autosampler run lists even after an analysis has started.

Detailed version of calibration summary

Provides specifics about a calibration – including “expected concentrations” vs. “measured concentrations” – enabling users to ensure the accuracy of their calibration and the quality/validity of their results.

Customizable “set limits” for individual elements

A new “Sample Limits” tab allows users to quickly and easily set up sample limit checks. When a sample result falls above or below a specified range, a message is displayed in the “Results” window. Users can specify whether or not they want the range included in the message.

Continuous graphics

The Optima 7000 DV ICP-OES offers a unique tool – continuous graphics. Continuous graphics offers a look at how the instrument is operating by acquiring and displaying data in real-time. The operating parameters of the instrument and RF generator can be modified as data are acquired, allowing method optimization to be further enhanced. For example, RF power and nebulizer flow can be changed, while their impact is monitored. Peristaltic pump speed can be set to improve noise and signal intensity, maximizing system performance.

Tools for optimum performance

The unique optical system of the Optima 7000 DV ICP-OES and its exceptional stability allow WinLab32 to include tools previously available only in high-end ICP-OES instruments. Features such as simultaneous background correction, inter-element correction (IEC) and multi-component spectral fitting (MSF) significantly enhance analytical performance and minimize potential interferences. All analytical data can be stored, recalled and re-examined. This allows data to be reprocessed, eliminating the need to rerun samples.

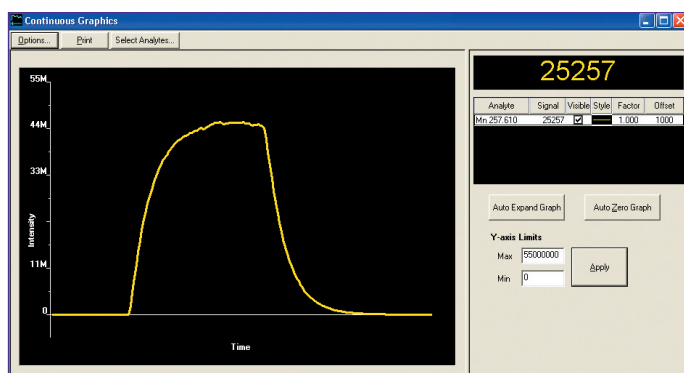


Figure 2. The Optima 7000 DV ICP-OES is capable of acquiring and displaying data in a continuous real-time graphics format. This is useful for optimizing or monitoring instrument performance. The graph shows the introduction of a 10-ppm manganese solution into the plasma, stabilization of the Mn signal, and subsequent washout.

Confidence in your analysis

Built-in diagnostics check each system component to verify proper operation. Leveraging on the Microsoft® Windows® operating systems, WinLab32 has added even more security features, including password-controlled access to software functions.

Regulatory compliance

Whether regulations are internal, industry or government-imposed, the optional WinLab32 Enhanced Security™ (ES) software gives you the tools you need. Built-in compliance features, including multiple user-defined Quality Control (QC) standards, check samples, internal standard checks and a selection of calibration procedures, ensure that you and your staff adhere to appropriate guidelines.

Reporting made easy

The WinLab32 report function uses Wizards to guide you through report generation step-by-step. With WinLab32's multi-tasking capabilities, you can even generate reports while the Optima 7000 DV system analyzes the next group of samples. WinLab32 stores all raw analytical data, so you can reprocess previously stored data with new conditions, eliminating the need to repeat analyses.

PerkinElmer, Inc.
940 Winter Street
Waltham, MA 02451 USA
P: (800) 762-4000 or
(+1) 203-925-4602
www.perkinelmer.com



For a complete listing of our global offices, visit www.perkinelmer.com/ContactUs

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