



## iCAP 7000 Plus Series ICP-OES

Streamlined performance and ultra-low ICP-OES detection limits for routine laboratories

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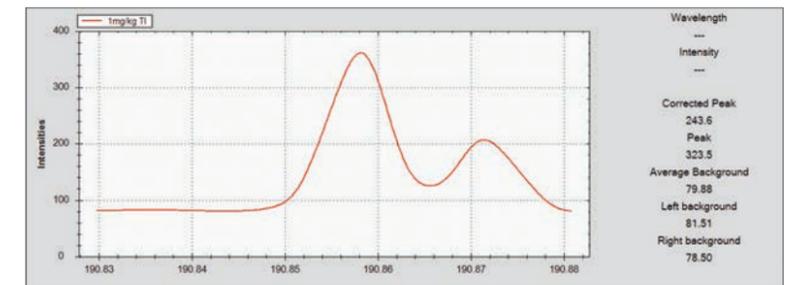
Powerful multi-element performance for routine and research applications with the flexibility to analyze the most challenging sample matrices

The Thermo Scientific™ iCAP™ 7000 Plus Series ICP-OES provides low-cost, multi-element analysis for measuring trace elements in a diverse sample range. The instrument combines advanced performance with high productivity and ease of use, resulting in consistently reliable data, while ensuring compliance with global regulations and standards.

- Optimized sample introduction for different sample types
- Robust plasma generation for complex matrices
- Optical system design for sub ppb detection limits
- Charge Injection Device (CID) detector for high linear dynamic range

The innovative ICP-OES technology is driven by the Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software and the Element Finder plug-in. The plug-in reduces method development time and removes the need for wavelength selection by the user. This delivers powerful, high performance and low-cost analysis for both high-throughput routine and research laboratories.

- Element Finder plug-in selects interference-free wavelengths
- Automated method development with plasma optimization tool
- Long-term stability through gas MFCs and temperature control
- Intelligent monitoring of analytes with Qtegra ISDS Software
- Predefined and customizable reports on demand



Thallium doublet at 190 nm.



# Delivering powerful performance with advanced, easy-to-use technology

This advanced technology enables maximum performance and flexibility to meet, and exceed, the analysis requirements of any substance - from drinking water to crude oil. It is achieved without the complication of a user interface, ensuring simple operation by analysts with any level of experience

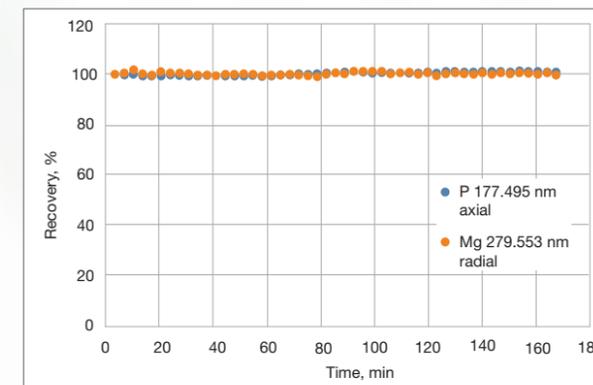
The high resolution optics enable effective interference separation. At 200 nm, the resolution is 7 pm, enabling the simple analysis of complex line-rich samples without excessively elaborate deconvolution. The low number of optical surfaces reduces reflective losses and maximizes light transmission from plasma to detector for superior detection limits. The Echelle polychromator is thermostatically controlled to 0.1 °C to achieve long-term stability with recalibration typically only required every 24 hours.

The iCAP 7000 Plus Series ICP-OES features superior signal detection and a large working dynamic range due to its unique CID. The CID enables complete access to the full spectrum between 166 and 847 nm in both radial and axial views, with the additional functionality to perform post-run integration of previously unquantified elements.



Total gas consumption of just 16 L min.

Unique features, for example, the drain sensor removes the usual challenges often associated with ICP-OES analysis.



Stability plot of phosphors and magnesium.

Analyze challenging samples with a self-optimizing robust plasma delivered by the swing frequency RF generator. The innovative design of the iCAP 7000 Plus Series ICP-OES delivers powerful analytical performance and stability.



The user-friendly sample introduction system with push-fit connections ensures rapid assembly and disassembly for cleaning and maintenance. Alternative sample introduction components can be added to increase the speed of analysis or for the analysis of special sample types.

# Laboratory optimization

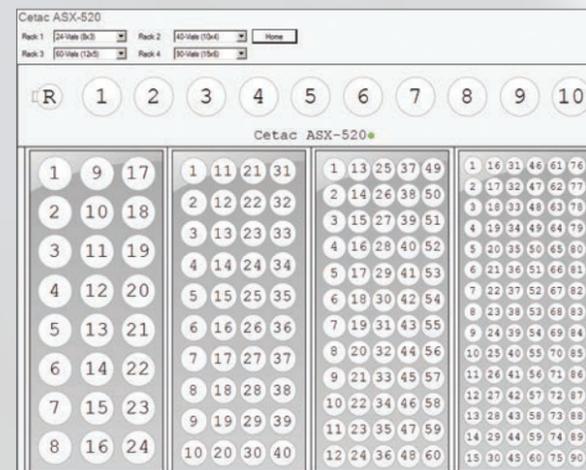
## Enable your analytical team to achieve more with advanced instrumentation

The iCAP 7000 Plus Series ICP-OES offers increased productivity as it requires minimal training for analytical teams and has rapid instrument start-up. Automated method development also simplifies routine analysis. Accessories are simple to connect to the sample introduction system and are controlled by the Qtegra ISDS Software plug-ins, which dramatically expand the power and performance of the instrument.

### Discreet sampling and auto-dilution

Higher throughput, lower maintenance and auto-dilution reduce the time and cost of analysis. Auto-dilution enables calibration from a single stock solution and the automatic dilution of samples that exceed the calibrated range or show bad internal standard recoveries, eliminate the need for additional post-run analysis.

The integrated Sprint Valve enables maximum sample throughput when combined with an autosampler. The Qtegra ISDS Software monitors data and makes decisions with respect to QCs and calibrations which are used to perform dilutions with the auto-dilution system.



### Hydride generation

This is a simple solution for increasing the detection capability of the hydride forming elements. Confidence in the detection of these elements at sub ppb concentration is delivered by the following options:

- A basic hydride kit which enables both non and hydride forming elements to be determined simultaneously
- An integrated hydride generation accessory which enables maximum improvement in detection of the hydride forming elements

The Thermo Scientific Qtegra Intelligent Scientific Data Solution (ISDS) Software and the Element Finder plug-in deliver quality and drive productivity. The intuitive and easy-to-use Element Finder plug-in automatically selects interference-free wavelengths and optimizes plasma conditions.

### Ease of use

Simple workflows minimize the steps needed to perform a task, giving analysts more time to focus on other activities. The 'Get Ready' feature takes your instrument from standby to ready-for-analysis through a fully automated process, saving time and ensuring consistent performance.

### Element Finder plug-in

The Element Finder plug-in automates method development, selecting wavelengths suited to your analysis and optimizing the plasma with an advanced tuning procedure. This eliminates interferences before you know you have them, and ensures maximum analyte sensitivity for all matrices.

Create a LabBook in five clicks and automatically start an intelligent workflow with a fully integrated QA/QC protocol.

### Integration of peripherals

The plugin architecture of Qtegra ISDS Software enables the connection to multiple industry standard sample preparation devices and autosamplers.

### Common platform

Qtegra ISDS Software is a control software supporting different analytical devices. This makes cross-training and the adoption of new instrumentation faster and easier, so you can expect increased flexibility in multi-technique laboratories.

### Automated reports and calculations

Data is exceptionally easy to manage, removing the need for proactive monitoring. The iCAP 7000 Plus Series ICP-OES and Qtegra ISDS Software minimize the requirement for analyst interaction during the analytical determinations.

### Data handling

- Query
- Reporting
- LIMS

### Compliance

- 21CFR PART 11
- Data security and access control
- Compliance management



# Environmental and human health

Powerful software and maximized instrument performance enable compliance with the latest regulations and legislation

## Agricultural screening

Maximize sample throughput when screening for nutrients and toxic elements with the Thermo Scientific iCAP 7600 ICP-OES Radial. This instrument provides robust sample introduction and plasma generation to enable analysis of high matrix samples such as soil extracts. Productivity enhancing technology - such as the Sprint Valve - drastically reduces uptake and wash time, increasing the speed of analysis. When used in conjunction with extended rack autosamplers, the number of samples that can be analyzed unattended is dramatically increased, freeing the operator to perform other tasks.

## Environmental analysis

Accurately quantify the elemental composition of a wide range of environmental samples. For challenging high solid samples such as sludge, the sample introduction and plasma generation efficiently process the matrix. For the analysis of drinking water, the iCAP 7000 Plus Series ICP-OES has the powerful detection capabilities required for the quantification of ppb concentrations. The simplified work flows of the Qtegra ISDS enable complex procedures specified by regulations to be easily adhered to using the automatic interference correction and quality control protocols. Short analysis time leads to a low quantity of waste being produced and low consumable requirements, minimizing both the cost of analysis and its environmental impact.

## Food production and safety

Monitor key toxic elements during food production with the dual view system. The low detection limits achieved using the axial view enable analysis which fulfills the requirements of a range of food safety regulations. Higher concentrations, typically analyzed for the nutritional labelling of products, are easily determined with the radial view, which extends the linear range of the instrument. The use of electronic signatures and workflow ensures full traceability of an analytical result.

## Pharmaceutical and nutraceutical compliance

Ensure you have qualified instrumentation to comply with current and future legislation, including the new General Chapters and one Supplemental General Chapter of the United States Pharmacopeia:

<232> Elemental Impurities – Limits

<233> Elemental Impurities – Procedure

<2232> Elemental Contaminants in Dietary Supplements

Qtegra ISDS Software provides full traceability of results and workflow, incorporating features to support compliance with CFR 21 Part 11, such as electronic signatures and audit trails. The dedicated validation solutions ensure fast instrument commissioning in your laboratory.



# Industrial applications

Powerful instrumentation delivers the highest performance for challenging samples

## Chemical QA and QC

The iCAP 7000 Plus Series ICP-OES increases your laboratory productivity with superior stability. Confidence in your results is ensured with dedicated sample introduction for different sample types; minimizing the drift associated with sample introduction, often caused by matrix deposition. The CID detector has a wide dynamic range to enable the analysis of trace contaminants in high purity chemicals or to measure high concentration matrix elements. The Qtegra ISDS software has intelligent QC functions to ensure that data meets the highest standard.

## Petrochemical

The dedicated radial system combined with a robust sample introduction system easily analyses a range of samples from crude oil to volatiles such as gasoline. The automated plasma optimization routine within the Qtegra ISDS software ensures optimum analysis conditions for the sample type. The iCAP 7000 Plus Series ICP-OES, combined with a dedicated oils autosampler which homogenizes samples prior to analysis, exceeds the requirements of demanding high-throughput applications such as the analysis of in-service oil. The addition of a Peltier cooled spray chamber enables analysis of elements at single figure ppb concentrations in volatile organic samples.

## Mining

The iCAP 7000 Plus Series ICP-OES is field-proven with low gas consumption for remote sites. Robust and reliable, it is designed to maximize uptime with minimal user maintenance. Dedicated accessories such as the Ceramic D-Torch coupled with the high solids sample introduction kit allow for simple analysis of high matrix samples. The Qtegra ISDS software is easy to use: create a LabBook in five clicks and automatically start a simple intelligent workflow. High volume autosamplers allow the unattended analysis of samples over extended periods of time.

## Metals and materials

The high-resolution Echelle optics and CID detector are especially well suited to the analysis of metals and materials where trace amounts of an element must be detected in complex matrices. The radial plasma instrument has robust matrix handling abilities, in order to minimize interferences. Both auto-dilution and monitored uptake and wash reduce carry-over, virtually eliminating the need to re-analyze expensive samples.



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## iCAP 7200 ICP-OES

A simple multi-elemental alternative to Atomic Absorption and Microwave Plasma Technology, providing increased sample throughput and lower detection limit capability.



## iCAP 7400 ICP-OES

Achieve an advanced level of stability, sensitivity and robustness for a range of applications with minimal user set-up and maintenance.



## iCAP 7600 ICP-OES

Secure the highest sensitivity and optimum detection limits: maximize results with the integrated sample loop which efficiently delivers the sample to the plasma.

Find out more at [thermofisher.com/ICP-OES](http://thermofisher.com/ICP-OES)

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