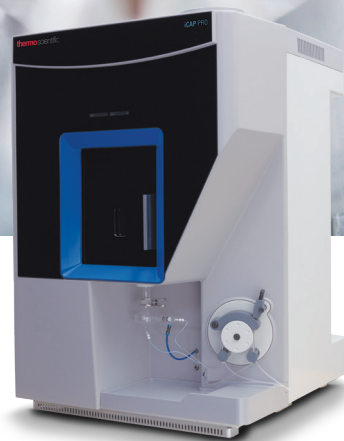


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iCAP PRO Series ICP-OES

Perform like a PRO
Simplicity, robustness and speed



ThermoFisher
SCIENTIFIC

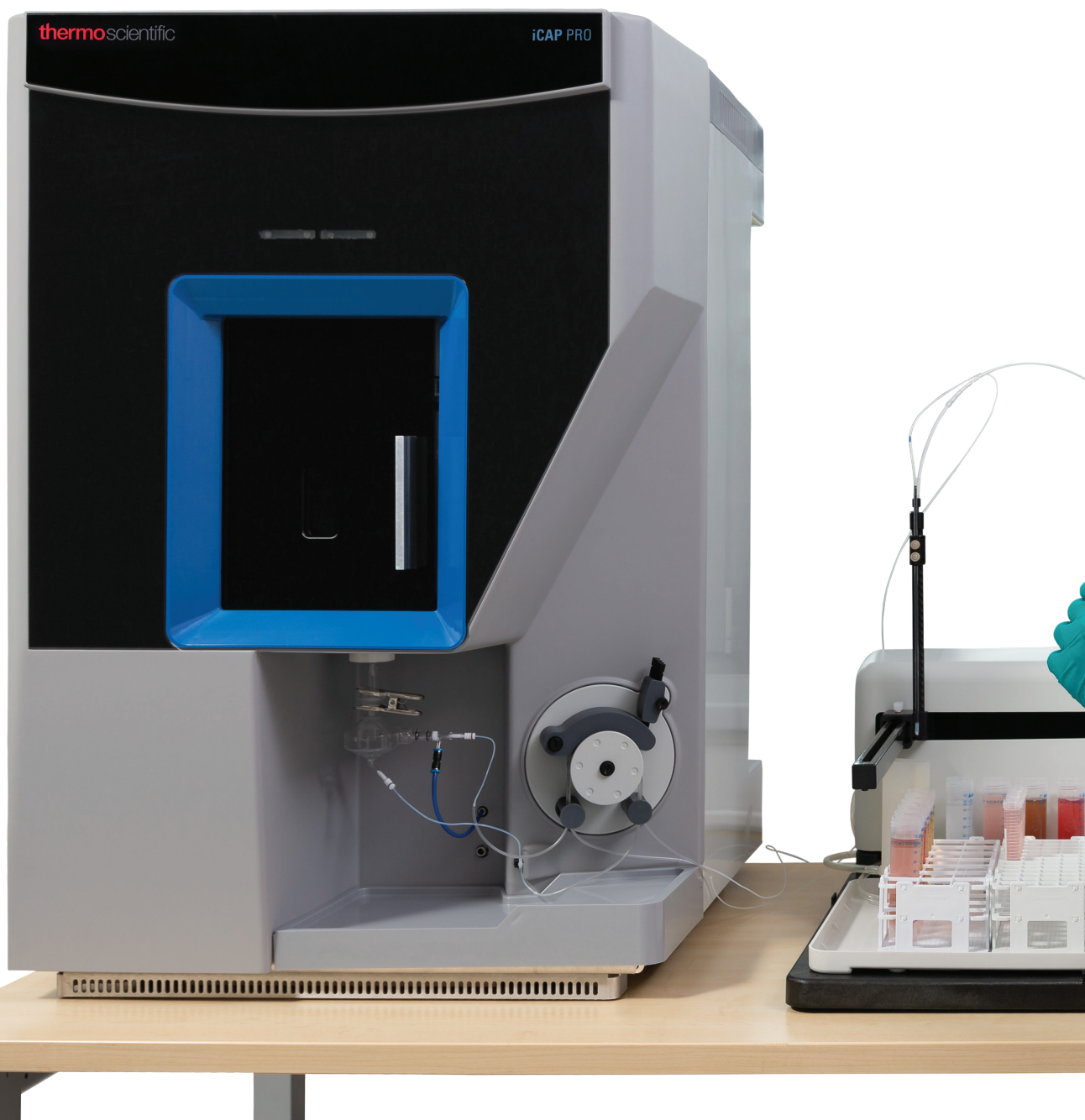
The iCAP PRO Series ICP-OES

Analyze even the most challenging sample matrices

The Thermo Scientific™ iCAP™ PRO Series ICP-OES combines powerful multi-element capability with flexibility so your lab is ready for any challenge.

Produce consistent, reliable data quickly and easily. Experience enhanced sample throughput, matrix tolerance and flexibility to produce results you can trust.

Achieve precise results first time, every time with the innovative Get Ready feature. This automated technology sets up the instrument for you and checks performance. Manage instrument processes using a logical dashboard interface. Trust in ICP-OES technology driven by Thermo Scientific™ Qtegra™ Intelligent Scientific Data Solution™ (ISDS) Software.



Obtain measurements fast

- Advanced, high-speed charge injection device detection technology produces results in the fastest possible time
- Consistent, predictable measurement times
- A small optical tank ensures fast start up time and reduced purge gas requirements. With start up times of just 30 minutes from power off and 5 minutes from standby (model dependent)
- Detect from % range to sub ppb detection limits with a high dynamic range detector
- Application-specific sample introduction systems reduce method development time

Experience more simplicity without compromising on detail

Easy to use Qtegra ISDS Software delivers both flexibility and simplicity.

- Easy to use for entry-level technicians
- Flexibility to fulfil demanding projects
- Long-term stability through gas MFCs and temperature control
- Full frame view immediately after measurement
- Intelligent monitoring of analytes with Qtegra ISDS Software
- Generate both predefined and custom reports on demand
- Plasma optimization tool with tune sets and auto-tune for automated method development

New features enhance user experience

- Plasma TV allows you to monitor the plasma during sample analysis
- Smaller design to fit easily in any laboratory
- Know at a glance whether the instrument is in use or on standby with status LEDs
- Beam blocker to maximize the lifetime of optical components



Fast, powerful performance.

Easy-to-use technology and software

Advanced technology combines optimal performance with flexibility. Exceed the analysis requirements of any substance from drinking water to crude oil. A simple user interface empowers intuitive operation by analysts with any level of experience. An ideal instrument for new ICP-OES users, the iCAP PRO Series ICP-OES is equally suited to experienced operators conducting high performance analysis.

Achieve effective interference separation with high-resolution optics

Simple analysis of complex line-rich samples is achieved without elaborate deconvolution, thanks to a resolution of <7 pm at 200 nm. Use of fewer optical surfaces minimizes reflective losses and maximizes light transmission from plasma to detector for superior detection limits. Advanced automatic stabilization dramatically reduces the instrument's warm-up time without impacting analysis times.

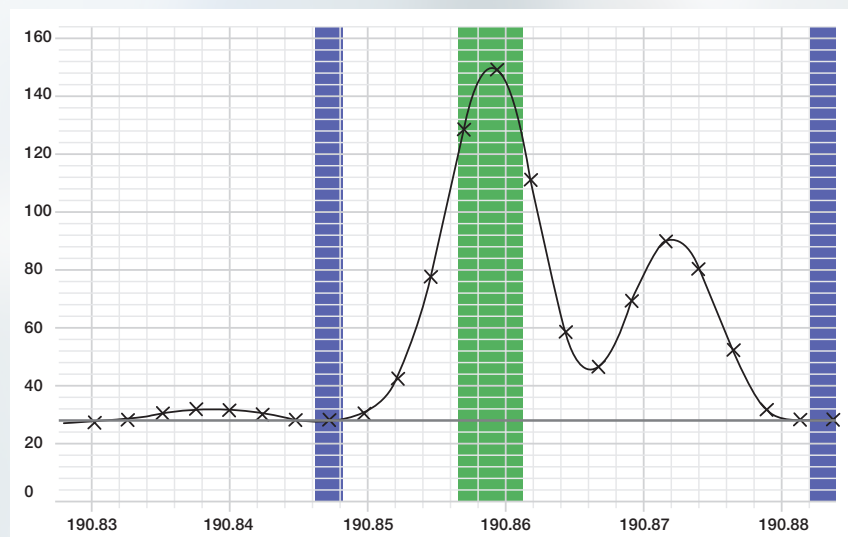
Achieve superior signal detection and a working dynamic range of 9 orders of magnitude. The iCAP PRO Series ICP-OES features a unique combination of double pass optics and an advanced CID detector.

Reduce the need for re-analysis of over-range samples

High speed random access CID allows complete simultaneous access to the spectrum between 167.021 to 852.145 nm, regardless of concentration.

Consistent results at any wavelength

- Large photo active area to cover the complete wavelength range
- High-speed electronics and readout to ensure consistent measurement times
- Random-access integration to negative blooming and pixel saturation



Thallium doublet at 190 nm

Optimized vertical torch for ultimate robustness

Both duo and radial view configurations of the instruments feature vertical torch orientation. When combined with the unique plasma interface, a new level of robustness is achieved.

Adjustable radial viewing height on both duo and radial view instruments, enabled by the vertical plasma interface.

Short warm-up time of just 30 minutes from switching the power on and just 5 minutes from standby (model dependent).

Increase robustness further with dedicated accessories and analyze the most challenging samples, such as saturated brine solutions.



Laboratory optimization

Rapid instrument start up and fast analysis times increase productivity

Routine analysis is simplified by automated method development features within the Qtegra ISDS Software. The capabilities of the iCAP PRO Series ICP-OES are further enhanced by dedicated accessories controlled directly by Qtegra ISDS Software plug-ins. These allow for method development and analysis to be carried out via one software package.



Discreet sampling and auto-dilution

Analysis time and cost are both reduced by auto-dilution which eliminates the need for additional post-run analysis. Samples exceeding the calibrated range or showing poor internal standard recoveries are automatically diluted.

Unique Qtegra ISDS Software monitors data and makes decisions on QCs and calibrations used to perform dilutions with the auto-dilution system. The Qtegra ISDS Software can also use the auto-dilution system to generate calibration standards from a single stock solution.

Hydride generation

Gain true confidence in detection of hydride forming elements at sub ppb concentration. The increased detection capability is achieved using:

- A basic hydride kit to simultaneously determine hydride forming and non-hydride forming elements
- An integrated hydride generation accessory enabling maximum detection of hydride forming elements



Easy to use

Trust in consistent performance and fast analysis with simple workflows that minimize the number of steps required to perform each task. Rely on the fully-automated Get Ready function to prepare the instrument from standby to ready.

Work flow driven software - Qtegra ISDS Software

Data streams are flexible, fully compatible with LIMS and can be exported in several formats.

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

Integration of peripherals

Unique plugin architecture of the Qtegra ISDS Software enables users to connect to multiple industry standard sample preparation devices and autosamplers.

Common platform

The Qtegra ISDS Software supports various analytical devices. Adoption of new instrumentation and cross-training of analysts becomes quicker and easier. Enjoy increased flexibility in multi-technique laboratories.

Automated reports and calculations

Remove the need to proactively monitor data. Analytical determinations take place with minimal analyst interaction using the iCAP PRO Series ICP-OES and Qtegra ISDS Software.

Compliance

Full traceability of results and workflow to support compliance with CFR 21 Part 11. Dedicated validation solutions ensure fast instrument commissioning.

Advanced technology delivering the ultimate ICP-OES performance

Sample introduction

The iCAP PRO ICP-OES systems are fitted with either a three- or four-channel high precision peristaltic pump. Both allow for the addition of an online internal standard or the use of hydride generation accessories.

A concentric glass nebulizer and glass cyclonic spray chamber are supplied as standard with the iCAP PRO ICP-OES instruments. These are ideal for the analysis of aqueous samples with up to 3% total dissolved solids.



A range of optional nebulizers and spray chambers for more diverse applications are available. These enable analysis of samples such as those containing hydrofluoric acid, organic solvents or with a total dissolved solids content of more than 3%.

For samples with a high total dissolved solids content, the sheath gas adaptor can be used on both the radial and duo systems of the iCAP PRO Series ICP-OES. This accessory offers ultimate robustness for the analysis of samples containing very high dissolved solids, such as saturated brine solutions.



Torch

The iCAP PRO Series ICP-OES instruments are supplied with a semi-demountable Enhanced Matrix Tolerance quartz torch. The duo torch is optimized to reduce easily ionized element interferences.

A ceramic semi-demountable torch is available for all instruments and is supplied as standard with the dedicated radial Thermo Scientific™ iCAP™ PRO XP ICP-OES and iCAP™ PRO XPS ICP-OES systems. The durable ceramic torch body ensures maximum torch lifetime is achieved with the high-matrix samples that are typically analyzed with radial systems.

Both torch types are designed for simplicity with a quick release pre-aligned mounting block, which requires no tools for removal. The torch mount incorporates automatic gas connections.

A range of center tubes for different applications is available, including a ceramic center tube for use with samples containing hydrofluoric acid.

Gas control

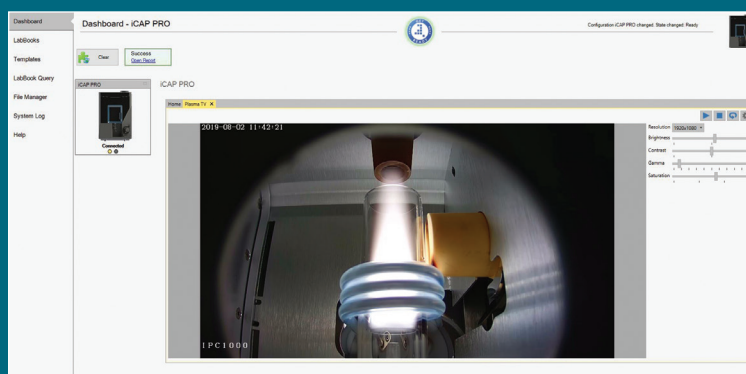
All systems incorporate a series of computer-controlled mass flow controllers (MFC) to ensure precise and stable delivery of plasma gas to the torch and carrier gas to the nebulizer.

An additional MFC is fitted to the iCAP PRO XP ICP-OES and iCAP PRO XPS ICP-OES with the ability to deliver the following gases:

- Air and oxygen for the removal of interferences when analyzing organic samples
- Argon for use with the sheath gas accessory

Radio frequency generator and plasma

The solid state, free running 27.12 MHz RF generator, induces plasma formation via the load coil. The plasma system is contained in an EMC enclosure with viewing window, plasma TV (available on the iCAP PRO XP ICP-OES and iCAP PRO XPS ICP-OES) and fast access, fully interlocked door.



Optics

The new high-energy echelle polychromator with a “side-by-side” arrangement of the prism and grating minimize the optical surfaces, ensuring maximum light throughput to the detector to achieve maximum sensitivity. This compact design also reduces pure gas requirements keeping the operating cost of the instrument at a minimum. The unique optical design ensures high image quality with a resolution of 7 pm at 200 nm and very low stray light performance.

The lower wavelength limit of 167.021 nm allows the determination of aluminum at the most sensitive wavelength of 167.079 nm and extends to 852.145 nm for the option of determining potassium at 766.490 nm and sodium at 818.326 nm.

The intelligent Full Range (iFR) analysis mode can measure wavelengths between 167.021 to 852.145 nm in one simultaneous measurement, significantly reducing analysis times. The iFR mode achieves excellent sensitivity without the need for multiple measurements from different slits to cover the spectrum.

The enhanced Ultra Violet (eUV) analysis mode can be used to further enhance sensitivity for elements that fall in the wavelength range of 167.021 to 240.063 nm, such as mercury, sulfur, lead and cadmium. The eUV analysis mode is available on the iCAP PRO XP ICP-OES and the iCAP PRO XPS ICP-OES.

Charge Injection Device Detector

The iCAP PRO Series ICP-OES uses the latest high speed Charge Injection Device (CID) detector technology, the new CID821. This unique technology consists of an array of over 4 million individually addressable pixels to ensure continuous wavelength coverage. The high read-out speed of the CID821 ensures consistent read-out times regardless of the number of wavelengths being measured.

The unique nondestructive read-out (NDRO) capability only available with a CID detector, allows measurement of the signal level on any pixel at any point in the exposure. This has the advantage of achieving optimum signal to noise for any wavelength anywhere on the detector, while maintaining wide dynamic range for all signals.

Agricultural screening

Enjoy maximum sample throughput during screening for nutrients and toxic elements. The Thermo Scientific™ iCAP™ PRO XPS Radial ICP-OES provides robust sample introduction and plasma generation. Analysis of high matrix samples, like soil extracts, has never been easier.

Environmental analysis

Accurately quantify the elemental composition of a wide range of environmental samples. Sample introduction and plasma generation efficiently process the matrix of challenging, high-solid samples like sludge. Powerful detection capabilities of the Thermo Scientific™ iCAP™ PRO XP Duo ICP-OES enable quantification of ppb concentrations for analysis of drinking water.

Food production and safety

Monitor key toxic elements during food production with the dual view system. Analyze samples to the standards required by a range of food safety regulations thanks to low detection limits achieved using the axial view. The instrument's radial view extends its linear range, enabling easy analysis of higher concentrations such as those required for nutritional labelling. Electronic signatures and workflow ensure all analytical results are fully traceable.

Pharmaceutical and nutraceutical compliance

Qualified instrumentation complies with current and future legislation, including the new General Chapters and a 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. It incorporates features to support compliance with CFR 21 Part 11, including electronic signatures and audit trails. Dedicated validation solutions ensure fast instrument commissioning in the laboratory.



Chemical QA and QC

Increase productivity in your laboratory thanks to superior stability of the iCAP PRO XPS ICP-OES. Have complete confidence in your results with dedicated sample introduction for different sample types. Such a function minimizes drift associated with sample introduction that is often caused by matrix deposition. Analyse trace contaminants in high purity chemicals and measure high-concentration matrix elements using the wide dynamic range of the CID detector. Qtegra ISDS software has intelligent QC functions to ensure highest quality data standards are met.

Petrochemical

Easily analyze samples ranging from crude oil to volatiles like petrol thanks to the robust sample introduction and dedicated radial systems. An automated plasma optimization routine within the Qtegra ISDS software provides optimum analysis conditions for each sample type. A dedicated oil auto-sampler homogenizes samples prior to analysis. Combine this with the iCAP PRO XP ICP-OES, and the demanding requirements of high-throughput applications like analysis of in-service oil are exceeded. Analyze elements at single figure ppb concentrations in volatile organic samples thanks to the addition of a Peltier cooled spray chamber.

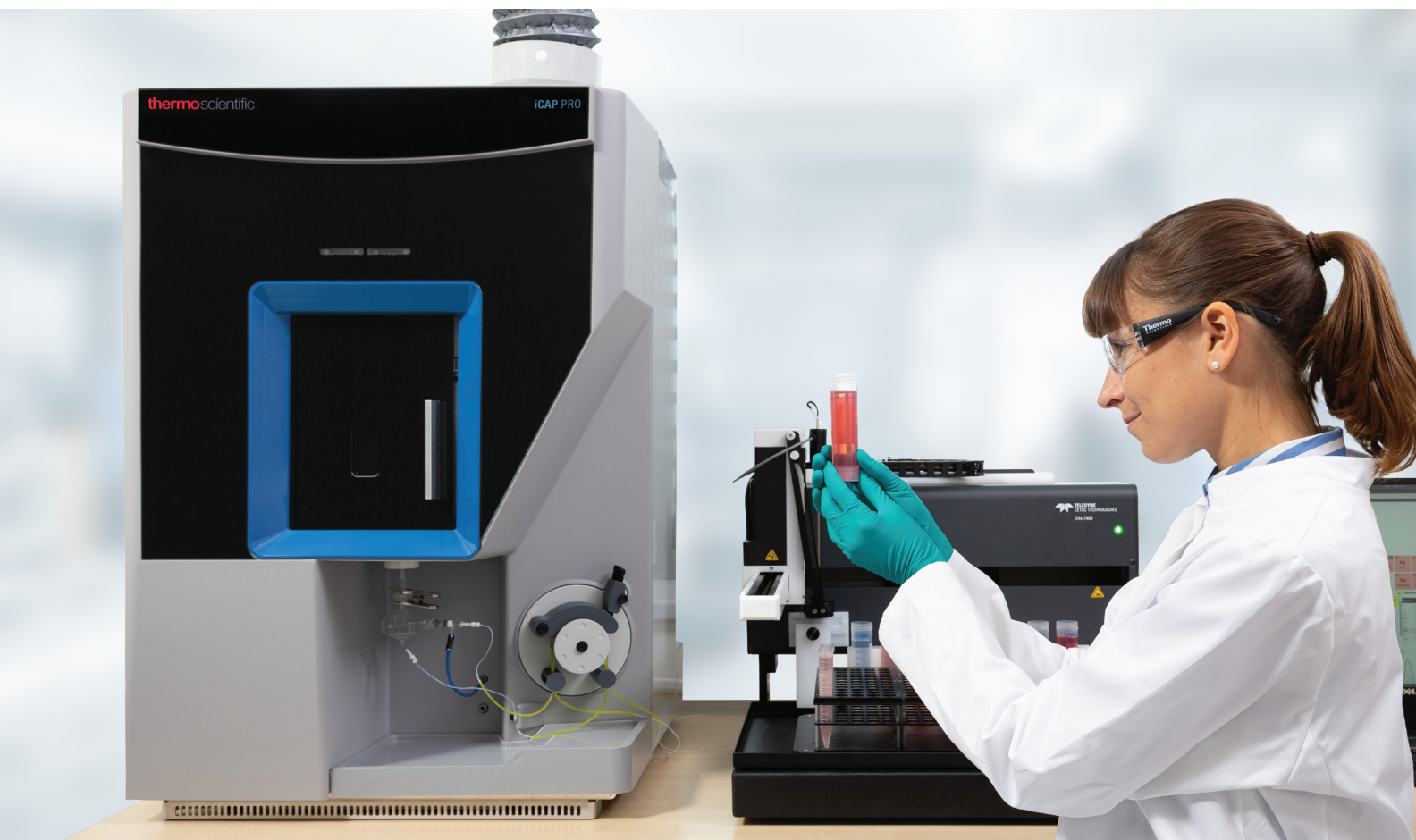
Mining

Gain absolute confidence in your results wherever you are with the field-proven iCAP PRO XP ICP-OES. A five minute start up time and low gas consumption make it ideal for remote sites. A robust, reliable design maximizes uptime whilst minimizing user maintenance. Dedicated accessories such as a Ceramic D-Torch coupled with a high-solids sample introduction kit allow simple analysis of high-matrix samples. Easy-to-use Qtegra ISDS software enables you to create a LabBook in five clicks and automatically start a simple, intelligent workflow. Unattended analysis of samples is possible over extended periods of time with high volume autosamplers.

Metals and materials

High-resolution echelle optics and the CID detector are ideal for analysis of metals and materials where detection of trace amounts of an element in complex matrices is required. To minimize interference, the radial plasma instrument has robust matrix-handling abilities. Repeat analysis of expensive samples is virtually eliminated thanks to auto-dilution, monitored uptake and wash reduce carry-over.





iCAP PRO ICP-OES and iCAP PRO X ICP-OES

Deliver robust, uncomplicated trace elemental analysis for your laboratory with the Thermo Scientific iCAP PRO ICP-OES and Thermo Scientific iCAP PRO X ICP-OES systems. These systems offer fast start-up, easy-to-use software and incredible speed, providing multi-element detection technology far superior to that of single-element AAS.

iCAP PRO XP ICP-OES

Analyze high-matrix trace elemental samples with sensitive multi-element detection and meet your data requirements with the optimal performance of the Thermo Scientific iCAP PRO XP ICP-OES. Rugged on all fronts, this system needs surprisingly little bench space or user maintenance.

iCAP PRO XPS ICP-OES

Experience high-speed analysis of your trace elemental samples with the Thermo Scientific iCAP PRO XPS ICP-OES. It meets your specific regulatory requirements with unmatched throughput and versatility.

Find out more at thermofisher.com/icp-oes

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Thermo Scientific iCAP PRO ICP-OES and Thermo Scientific iCAP PRO X ICP-OES

Cost-effective multi-element analysis

Benefits

- Cost-effective alternative to AAS
- Easy to use with pre-optimized settings
- Comprehensive Qtegra ISDS Software

Keywords

Ease of use, elemental analysis, ICP-OES, simplified work flow

Deliver robust, uncomplicated trace elemental analysis in your laboratory with the Thermo Scientific™ iCAP™ PRO ICP-OES and Thermo Scientific iCAP PRO X ICP-OES systems. These systems incorporate easy-to-use software and multi-element detection technology far superior to that of the single-element AAS and multi-element microwave plasma techniques. These instruments are ideal for laboratories with low sample throughput requirements. For ease of use, a number of optimized settings are

defined as standard, making them ideal for users new to the technique or those who require a simple solution for multi-elemental analysis. The new vertical torch design for all instrument models ensures high matrix robustness for a range of sample types. The iFR (intelligent Full Range) analysis mode measures the entire wavelength range in one measurement, simplifying method development and analysis without comprising sensitivity or accuracy.



iCAP PRO ICP-OES and iCAP PRO X ICP-OES hardware summary

Sample introduction

The bench height sample introduction system is positioned to facilitate user accessibility to all parts.

Spraychamber

- Single-pass cyclonic spraychamber to efficiently filter out larger aerosol droplets for improved plasma stability
- Compatible with all 6 mm OD nebulizers
- Optional spraychambers for total dissolved solids tolerance and resistance to organics or aggressive mineral acids

Nebulizer

- Glass concentric nebulizer for optimal sample consumption
- Optional nebulizers in a range of flow rates, total dissolved solids tolerance and resistance to organics or aggressive mineral acids

Torch

- Demountable Enhanced Matrix Tolerance (EMT)
- All connectivity (argon gas supplies and plasma ignition) designed into the torch holder, reducing complexity and improving usability
- Proprietary, screw-in, self-aligning injector for simplicity and reproducibility

Peristaltic pump

- High precision 12 roller, 3 channel pump
- Pump tubing options are available for aqueous and samples containing organic solvents
- The iCAP PRO ICP-OES pump speed is optimized at 45 rpm
- The iCAP PRO X ICP-OES pump speed optimized and selectable at 30 or 45 rpm

Inductively coupled plasma

The iCAP PRO Series ICP-OES plasma system is designed to rapidly adapt to changing matrices and provide unparalleled robustness even for challenging samples such as brine samples.

RF generator

- Argon ICP source with digital, solid state RF generator
- Dynamic frequency impedance matching the plasma at 27 MHz
- Highly stable and robust plasma
- The iCAP PRO ICP-OES power is optimized at 1150 W
- The iCAP PRO X ICP-OES power is optimized and selectable at 750, 1150 or 1350 W

Load coil

- Water-cooled load coil with PTFE coating for improved lifetime and reliable plasma ignition

Plasma viewing

Dedicated radial plasma

- The vertical plasma is viewed directly in a radial mode using high efficiency mirrors
- The foreoptics are fully purged to provide enhanced performance in the UV region of the spectrum
- Optimized radial viewing height of:
 - 10 mm for Duo instruments
 - 11 mm for Radial only instruments

Dual view plasma

- The vertical dual view plasma may be viewed axially for applications requiring the lowest detection limits or radially to minimize matrix effects and extend the working range
- The dual purged optical path interface ensures excellent sensitivity in the UV region of the spectrum

Optical system

Type

- High energy Echelle cross dispersion optical system with “side-by-side” optical arrangement of prism and grating
- Unique mirror design for very high image quality, improved optical resolution and very low stray light performance

Spectrometer optical path

- The entire spectrometer and foreoptics are purged with either argon or nitrogen to ensure high light transmission in the UV region

Spectral bandpass

- <7 pm at 200 nm

Wavelength coverage

- Capture the entire wavelength range in one measurement with the unique iFR analysis mode
- Lower wavelength limit of 167.021 nm allowing the determination of aluminium at the most sensitive wavelength of 167.079 nm
- Wavelength coverage extends to 852.145 nm for the option of determining potassium at 766.490 nm and sodium at 818.326 nm

Detector

Type

- New CID821 high performance solid state Charge Injection Device (CID). The new Thermo Scientific™ CID821 is an enhanced camera device delivering high contrast/low noise imaging and quantification of all wavelengths in the analytical range without blooming. The new device offers possibility of measuring high intensity WL next to low intensity WL (overlapping sub) without impact of measurement results

Array size

- Four mega pixel individually addressable detector pixels of 12 µm x 12 µm in a 2048 x 2048 array for continuous coverage of the available wavelengths

iCAP PRO ICP-OES and iCAP PRO X ICP-OES configuration

Table 1.

Configuration	iCAP PRO ICP-OES	iCAP PRO X ICP-OES
Peristaltic pump	3 channel optimized at 45 rpm	3 channel selectable at 30 or 45 rpm
Nebulizer	Glass concentric	
Spraychamber	Single pass glass cyclonic	
Torch orientation	Vertical (both radial and dual view)	
Injector	Quartz 1.5 mm standard for radial 2 mm standard for duo	
RF generator	27 MHz, optimized at 1150 W	27 MHz, selectable at 750, 1150 or 1350 W
Load coil	Water cooled with PTFE coating	
Ar gas flow controllers	Nebulizer <ul style="list-style-type: none">• MFC tunable via software• Adjustable between 0.3-0.5 L/min Auxiliary <ul style="list-style-type: none">• MFC stabilized• Fixed at 1.5 L/min Plasma <ul style="list-style-type: none">• MFC stabilized• Fixed at 12 L/min	Nebulizer <ul style="list-style-type: none">• MFC tunable via software• Adjustable between 0.0-1.5 L/min Auxiliary <ul style="list-style-type: none">• MFC stabilized• Selectable 0.5 or 1.5 L/min Plasma <ul style="list-style-type: none">• MFC stabilized• Fixed at 12 or 14 L/min (RF power related)
Plasma viewing	Radial and duo (axial view and radial view)	
Optical system	Echelle cross dispersion optical system with "side-by-side" optical arrangement	
Optical path purge	Argon or nitrogen purged	
Spectral resolution	<7 pm at 200 nm	
Wavelength range	167.021 to 852.145 nm	
Detector type	Charge injection device CID821	
Array size	2048 x 2048 pixel array	
Full frame imaging	Yes	
Startup time	1 hour	From power off, gas off 1 hour From Standby 15 minutes
Standby gas flow	Standby not available	0.4 L/min
Minimum integration time	30 seconds	15 seconds
Detector cooling temperature	-45 °C controlled within 0.1 °C	

Site requirements and dimensions

Table 2.

Environmental		
Temperature	Range	15-35 °C
	Rate of change	< 2.5 °C·h ⁻¹
Humidity	Range	20-80% (non-condensing)
Utilities		
Electrical	Supply	200-240 V AC, 50/60 Hz single phase
	Power	Apparent power: 2694 VA Effective power: 2605 W
Cooling water	Supply temperature	25 °C
	Supply rate	> 2 L·min ⁻¹
	Pressure	0.2 MPa (2bar)
Argon gas supply	Purity	> 99.995%
	Typical flow rate	16 L·min ⁻¹
	Pressure	0.55-0.6 MPa (5.5-6.0 bar; 82.5-90 psi)
Plasma exhaust	Port dimensions	135 mm (recommended 120 mm ID ducting)
	Flow rate (120 mm ID ducting)	180-220 m ³ ·h ⁻¹ for radial and duo systems

Find out more at thermofisher.com/icp-oes

The Thermo Scientific iCE 3300 AA Spectrometer provides the complete elemental analysis package with stunning simplicity, innovative design and superior performance.

Thermo Scientific iCE 3300 AA Spectrometer

High performance, versatile, double beam Atomic Absorption Spectrometer



The ground-breaking iCE 3300 AA Spectrometer makes even the most complicated analyses simple. Superior, double beam optics provide unrivalled performance, while the innovative hardware and software design ensures that running samples, developing methods and maintaining the instrument is easy.



- Improved, efficient design minimises the footprint of the instrument and ensures that day-to-day analysis and maintenance is simple
- Enhanced, user-friendly software and comprehensive Wizard-driven interface to guide you through every aspect of an analysis
- High precision, double beam optics produce unparalleled detection limits and exceptional optical stability
- New universal titanium burner with improved solids capability increases the efficiency and accuracy of your flame analysis
- Unique Quadline background correction with guaranteed performance
- Safety comes as standard with integrated software, hardware safety features and automatic gas control
- Simple installation and operation of the pre-aligned furnace and auto-sampler module
- Unique furnace vision system improves efficiency of furnace analysis and method development (optional upgrade)
- Security software and validation packages allow complete 21 CFR part 11, GLP and GALP compliance (optional upgrades)

The iCE 3300 offers unrivalled flame sensitivity which is achieved by high efficiency nebulization through a fully inert impact bead, spoiler and spray chamber. The new finned universal titanium burner ensures exceptional atomization, even with the most difficult samples. The fully automatic gas box uses binary flow control for safe, reliable and repeatable analysis with all flame types.

All critical parameters can be optimized automatically if required – burner height, gas flows, even optical instrument parameters.

The iCE 3300 accepts the GFS33 Integrated Graphite Furnace and Auto-sampler Module which offers the best in detection limits with minimum interferences. Dynamic optical temperature feedback ensures accurate heating rates up to 3000 °C per second regardless of cuvette age. Add to that the optional unique furnace vision system then you have the ultimate in effective and easy furnace method development.

The GFS33 offers unrivalled graphite furnace automation. Huge capacity and infinite solution preparation facilities cater for all needs. With automated ash/atomise temperature optimisation, auto-sampler loading guides and the Thermo Fisher Scientific unique guaranteed background correction system, furnace analysis has never been easier. The auto-sampler remains permanently in alignment with the furnace completely eliminating the need to re-align the probe every time the furnace is fitted.

Thermo Fisher Scientific is the only supplier offering Extended Lifetime Cuvettes (ELC) with up to 10 x more lifetime than alternatives. Couple this with features such as pre-heated cuvette injection, cooling water temperature compensation and fast furnace operation - making it the safest choice.

The Thermo Scientific iCE SOLAAR AA software package is both intuitive and helpful. Extensive wizards are able to guide the user through various operational procedures making start-up a simple and quick process.

Additional information on the operational conditions for any elemental analysis is available in the help text and cookbook.

A full range of accessories are available to permit flame auto-sampling, intelligent dilution, vapour analysis, validation, automated graphite furnace and much, much more.

Technical Specification

Optics	Double Beam
Monochromator	0.27 m Ebert type
Lamp Carousel	6 Lamp Coded, Auto-aligning
Photomultiplier	Choice of standard or wide range types
Flame Atomiser	Universal system (uses 50 mm Ti burner)
Furnace Atomiser option	GFS33 combined module
Furnace Vision System	Optional
Background Correction	Guaranteed Quadline deuterium system
Gas Management	Automatic binary control
PC Software	Included as standard
Validation Package	Optional

The Thermo Scientific iCE 3000 Series comprising of:-

iCE 3300 Atomic Absorption Spectrometer:-

Single flame atomizer AAS with fully automatic gas box.

iCE 3400 Atomic Absorption Spectrometer:-

Single furnace atomizer AAS with Zeeman and D₂ background correction.

iCE 3500 Atomic Absorption Spectrometer:-

Dual flame and furnace system AAS with Standard or Zeeman furnace option.

The iCE 3000 Series provides an unrivalled range of solutions from Thermo Fisher Scientific; the award winning innovator in Atomic Absorption Spectrometry.

iCE 3000 Series Atomic Absorption Spectrometers



Refreshingly different Atomic Absorption ... just add iCE



Food & Agriculture



Environmental



Clinical & Pharmaceutical



Metals & Materials

The Thermo Scientific iCE 3000 Series Atomic Absorption Spectrometers are refreshingly different from any other atomic absorption instrument. They are compact, stylish and designed with ease of use as a priority.

Thermo Fisher Scientific is the leading provider of analytical instruments, equipment, reagents and consumables, software and services for research, analysis, discovery and diagnostics.

- 50 years of AA experience
- Award winning innovators in Atomic Absorption
- True dual atomization
- World wide service and applications support
- Pioneers of the ground breaking iCAP ICP

Refreshingly different

- **Ergonomically designed**
Easily accessible lamp carousel, quick fit lamps and flame compartment tray, speed up simple instrument tasks
- **Unique integrated furnace vision system**
For effective and easy furnace method development
- **New improved burner design**
Even with the most difficult samples, operation is prolonged and trouble free
- **Enhanced software**
Renowned for its usability, extensive help functions and cookbook, the iCE SOLAAR software is now better than ever
- **New and extended wizards**
Enables effective system utilization for quick, high productivity
- **Extensive auto optimization procedures**
Let the instrument optimize critical parameters, saving you time





Ease of use

It's crystal clear why an iCE 3000 Series instrument is so easy to use

- ✓ Compact and user-friendly
- ✓ Wizard software
- ✓ New improved atomizer design
- ✓ Integrated furnace vision system
- ✓ Self-checking iSQ tests
- ✓ Extended life time cuvettes
- ✓ Language options
- ✓ Sealed optics
- ✓ Quick to set up
- ✓ Auto-optimization
- ✓ Ergonomic design
- ✓ Intelligent lamp operation
- ✓ USB connection
- ✓ Comprehensive cookbook
- ✓ User configurable auto-sampler
- ✓ Automatic flame/furnace changeover

Flame Analysis

Optimization of flame system

Optimization routines can be included as part of your method so that the parameters are truly optimal.

Unbeatable flame performance

Superior detection limits and a fully inert sample system.

Safe and easy gas control

The gas control system is fully automatic thus ensuring repeatable flame conditions and safety.

Fully customizable auto-sampler

Configure the solutions to your personal preference.

Deuterium background correction for easy analysis

Deuterium background correction is provided by a unique Quadline D₂ source which gives guaranteed background correction.

Optics designed for precision and ease-of-use

Self-calibrating monochromators and auto-aligning lamps ensure simple optical setup and optimum light throughput.

Furnace Analysis

Integrated furnace vision tool

Enables vital information to be gained on sample injection and behaviour and is now a standard feature on selected instruments.

New furnace wizard

Guides you through the important steps required to achieve a fully optimized method with minimum effort.

Configurable furnace auto-sampler

Define where you would like samples, standards and modifiers to be positioned according to your requirements.

Optical feedback temperature control

The software will automatically control cuvette heating meaning that results will be drift free, accurate and repeatable.

Long life cuvettes

A wide range of cuvette types are available for all analysis needs, including Extended Lifetime Cuvettes (ELC).

Zeeman background correction option

Provides correction at the same wavelength as the analyte.

Gas flow

Two independently controlled gas streams are intelligently controlled via the software.





Thermo Scientific iCE SOLAAR Software

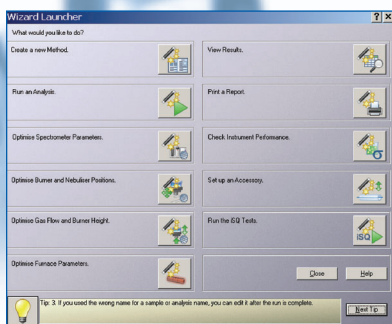
The iCE SOLAAR AA software package is intuitive and helpful. Extensive wizards guide you through various operational procedures making start-up exceptionally quick and simple.

The help text and cookbook provide additional information on the operational conditions for any elemental analysis. Application tips for sample preparation, matrix modifiers and many other important factors are available in the software. This support will give you the confidence to perform a successful analysis, no matter how difficult your samples seem.

There are many wizards available to walk you through various operations to achieve complete instrument and method set up.

Wizards get you productive fast by:

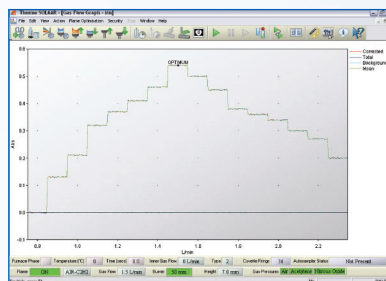
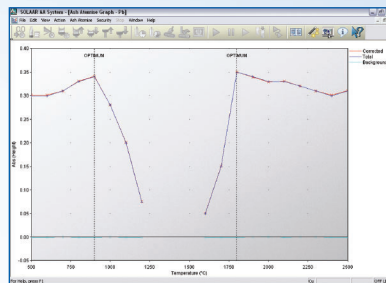
- Providing step by step guides to routine activities
- Allowing more advanced facilities to be explored as experience grows
- Demonstrating the correct sequence of operations to achieve a specific objective
- Giving users an opportunity to learn



Thermo Scientific SOLAAR Security

SOLAAR Security is able to secure your data for compliance purposes or just for good practice.

Provides all the tools you need to comply with the FDA 21 CFR part 11 ruling by adding e-signatures, event logs, audit trails and access controls.



Thermo Scientific iCE 3000 Series Product Range

Thermo Scientific iCE 3300

Single flame atomizer AAS with fully automatic gas box.

Complete solution for laboratories with a main need to perform flame analysis but with occasional furnace samples.

- Simple flame system but with incredible versatility
- Six lamp auto-aligning carousel
- Double beam optics and self-calibrating Ebert monochromator.



Thermo Scientific iCE 3400

Single furnace atomizer AAS with Zeeman and D_2 background correction.

When challenging detection limits are critical.

- Six lamp auto-aligning carousel
- Furnace vision
- Echelle dual prism and and grating monochromator
- Vapour system and electrically heated cell can be utilised in this instrument



Thermo Scientific iCE 3500

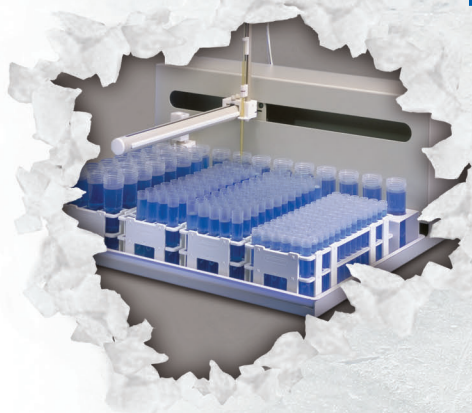
Dual flame and furnace AAS with standard or Zeeman furnace option. Essential furnace vision tool included as standard.

Ideal for high throughput environments with a requirement for quick and regular flame and furnace analysis.

- Software-controlled changeover from flame to furnace analysis without the operator even being in the room!
- Six lamp auto-aligning carousel for maximum light throughput
- D_2 background correction for flame and furnace analysis
- Zeeman background correction option available for furnace work
- Double beam optics with a dual monochromator consisting of an echelle prism and a grating



Thermo Scientific AA Accessories

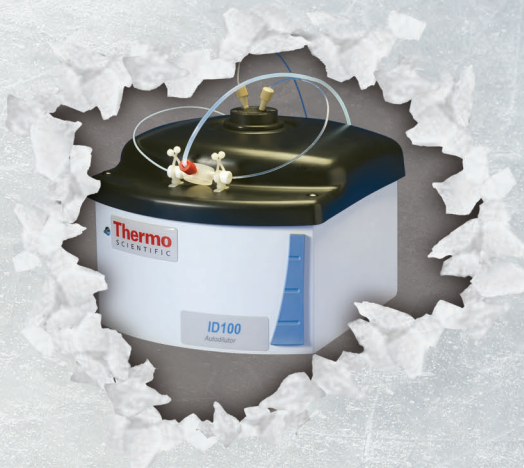


Flame Auto-Sampler

iCE 3000 Series instruments support a range of auto-samplers made by CETAC to fulfill your more demanding volume workloads.

Flame Dilution - ID100

This accessory can make standards from a master solution quickly and accurately. High-speed intelligent dilution will bring out of range samples into the calibration range.



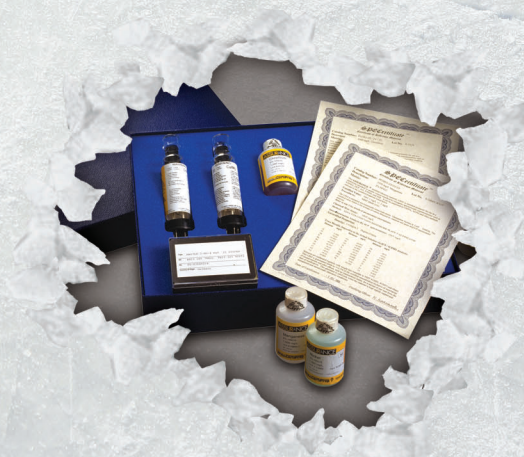
Vapor Generation - VP100

This fully software controlled system is a simple and cost effective way to reach lower detection limits for the Arsenic group elements. The optional EC90 electrically heated cell can offer improved performance and safety.



Validator Packages

A comprehensive log book with pre-printed forms, detailed SOP's and integrated software. Providing all you need from specification, design and installation qualification to operational and performance qualification.



Intelligent Spectrometer Qualification (iSQ)

A calibrated module is used to test various performance criteria of your instrument and provides the user with a simple and convenient pass and fail report.

A refreshingly different Atomic Absorption

The Thermo Scientific iCE 3000 Series AAS is the clear and safe choice of instrument to complete your elemental analysis needs.

	iCE 3300	iCE 3400	iCE 3500
Atomizer type	Flame / furnace option	Furnace	Flame and furnace
Simple software	Yes	Yes	Yes
Full set of Wizards	Yes	Yes	Yes
Ergonomic design	Yes	Yes	Yes
New improved flame atomizer	Yes	Not applicable	Yes

Thermo Fisher Scientific AA, ICP and ICP-MS

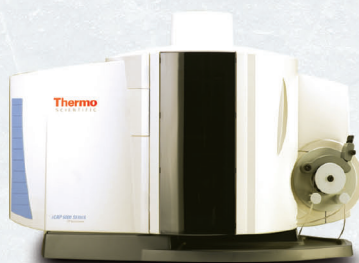
The use of Atomic Absorption (AA), Inductively Coupled Plasma (ICP) and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) are the accepted and most powerful techniques for the analysis and quantification of trace elements in both solid and liquid samples.

Thermo Fisher Scientific is the only instrument manufacturer to offer AA, ICP and ICP-MS (Quadrupole and Sector) spectrometers to satisfy every aspect of routine to highly demanding research applications.

Develop your lab from the easy-to-use iCE Series AAS and high performance iCAP ICP or XSERIES 2 Quadrupole ICP-MS and up to the ultra-sophisticated ELEMENT2 HR-ICP-MS instrument. All instruments are designed with cutting-edge technology and are ideal for a wide range of applications including: environmental, materials, geological, food safety, clinical, semi-conductor, metallurgy and petrochemicals.



iCE 3000 Series AAS



iCAP 6000 Series ICP



XSERIES 2 ICP-MS



ELEMENT2 HR-ICP-MS

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

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