



WORKFLOW, MAXIMIZED
DOWNTIME, MINIMIZED



Avio® Max Series ICP-OES

MULTITASKING SOLUTIONS FOR MULTIELEMENTAL ANALYSIS

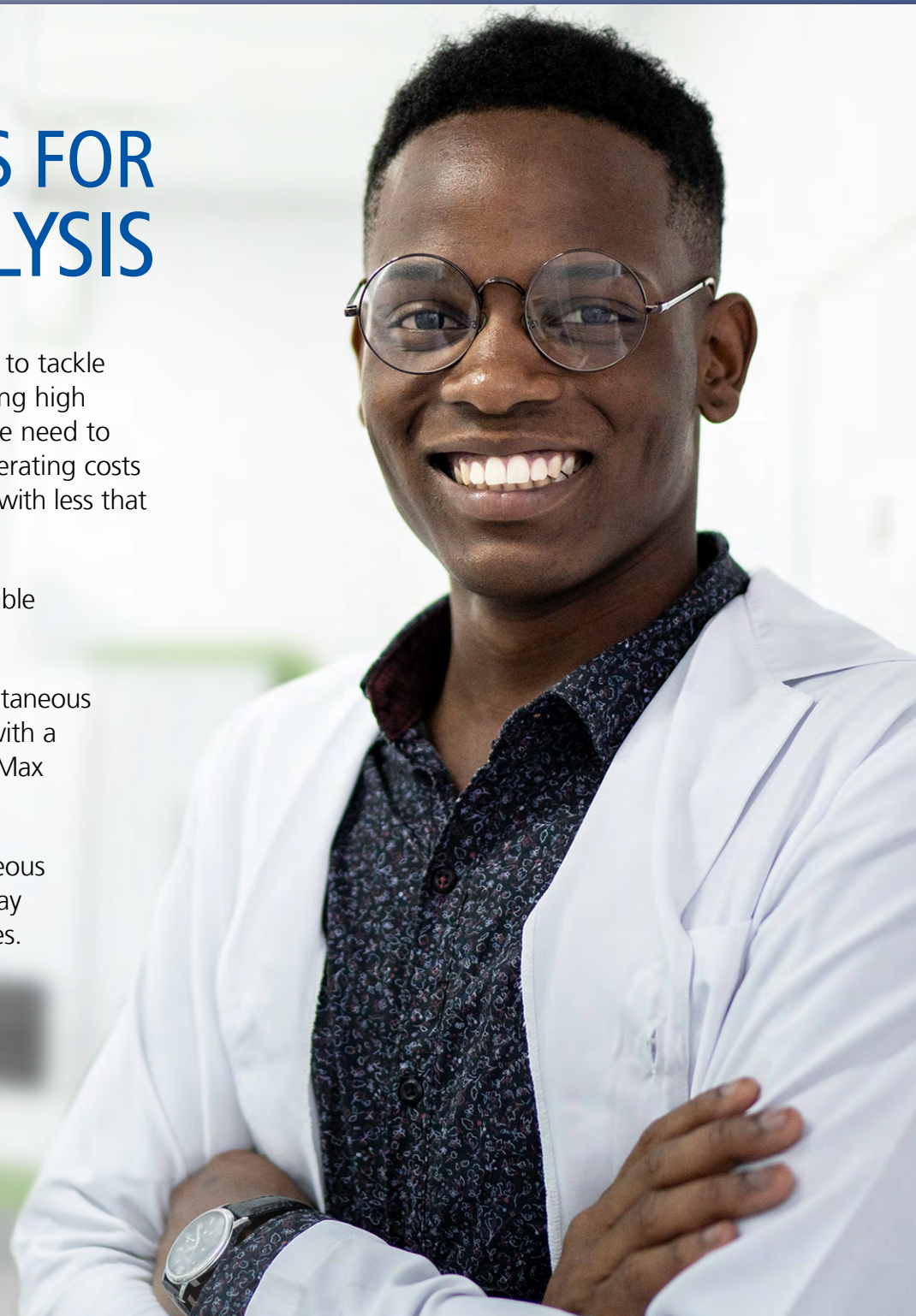
Today's laboratories conducting multielemental analyses are expected to tackle quick turnaround times and meet lower detection limits while delivering high levels of sample accuracy. Workloads and workflows may vary, but the need to work quickly doesn't. At the same time, every lab is looking to lower operating costs and reduce maintenance. Bottom line, it's the push to do much more with less that drives both scientific and business decisions.

Enter the **Avio® Max Series**: the ICP-OES systems that are as comfortable with multitasking as you are.

With Avio 550/560 Max systems, you have high-throughput, fully simultaneous ICP-OES instruments that deliver exceptionally fast performance. Plus, with a built-in high-throughput sample-introduction module on the Avio 560 Max system, you can reduce 1.5-minute runtimes to about 30 seconds.

And our Avio 220 Max system – the industry's pioneer hybrid simultaneous ICP-OES for demanding multielemental analyses – provides plug-and-play performance that takes you from cold start to analysis in just 10 minutes.

What's more, these systems can use half the argon of competitive systems, with zero-maintenance features that deliver maximum uptime and exceptional productivity, regardless of workload -- all with an enhanced user experience.



TECHNOLOGY

APPLICATIONS

FULLY SIMULTANEOUS ICP-OES FOR DEMANDING WORKFLOWS

The **Avio 550/560 Max systems** are ideal for high-throughput testing labs and manufacturing QA/QC laboratories. The Avio 550 Max system is equipped with a standard sample-introduction setup, whereas the Avio 560 Max comes with a built-in high-throughput sample-introduction module for even faster analysis. They deliver the lowest argon consumption of any ICP – at least 50% lower than other systems. Plus, Syngistix™ software offers smart workflows for increased operational efficiencies and sample accuracy. These systems deliver all the speed you need to guarantee you meet your turnaround times.



TECHNOLOGY

APPLICATIONS

THE HYBRID SIMULTANEOUS SYSTEM FOR EVERYDAY WORKLOADS

From cold start to analysis in just 10 minutes: the plug-and-play **Avio 220 Max system** boasts the fastest startup in the business, saving you time and operating costs by allowing you to shut down the instrument between runs. Plus, it consumes approximately half the argon of competitive systems for additional cost savings. And Syngistix software offers intelligent workflows for enhanced operational efficiencies and sample accuracy. The Avio 220 Max provides exceptional stability and minimum sample preparation thanks to the combination of its proprietary technologies – making it the perfect ICP solution for labs with smaller workloads, but where performance is still key.



550/560 MAX

AVIO 550/560 MAX: ALL-IN-ONE ICP-OES

Whether your lab tests environmental, industrial, chemical, food, or pharmaceutical samples, you've got to up your game, analyzing higher volumes of multielemental samples more efficiently than ever before. So your technology has to keep pace, delivering the speed, throughput, sensitivity, and uptime you need – all while keeping an eye on operational expenses.

▶ EXCEPTIONAL THROUGHPUT



EXCEPTIONAL THROUGHPUT

For most labs, throughput is the biggest challenge – and that's where the Avio 550/560 systems really deliver. These fully simultaneous systems provide leading throughput, perfect for high sample demands. The systems' **Dual View technology** delivers full-wavelength coverage with superior sensitivity, so even elements at high or low wavelengths can be measured with confidence in the same run. What's more, the built-in **High-Throughput System (HTS)** on the Avio 560 Max dramatically reduces sample-to-sample times with faster sample uptake, stabilization, and washout.

TECHNOLOGY

APPLICATIONS

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▶ LOW COST OF OWNERSHIP

LOW COST OF OWNERSHIP

The systems' **vertical torch mount** lets you quickly and easily adjust, even while the system is running, for maximum performance with no required maintenance. And the removable injector is independent of the torch, reducing maintenance and the potential for breakage.

Our robust, proprietary **Flat Plate™ plasma technology** generates a robust, matrix-tolerant plasma that uses half the argon of competitor systems. Two flat-plate induction fields sit perpendicular to the sample flow, which generates a stable, symmetrical plasma that reduces the need to change dewars and cylinders, with no maintenance or cooling required.

And innovative **PlasmaShear™ technology** eliminates the cool tail plume of the plasma, removing the need for high-extraction systems or cones and delivering low-maintenance, fully automated, argon-free interference removal.

TECHNOLOGY

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▶ SIMPLE TO USE



SIMPLE TO USE

Right from the start, our Avio 550/560 Max systems (and the Avio 220 Max) are built for super-efficient performance with little to no maintenance required. On top of that, our **Syngistix** software has been designed from the ground up to mirror your workflow, delivering an intuitive, easy-to-learn interface with smart features to increase your uptime and ensure accurate results. Icon based, with simple, smart methods, the system delivers fast, easy operation with minimal training. And it provides a common software platform that spans our AA, ICP-OES, and ICP-MS platforms.

[Click here to read more about Syngistix software.](#)

TECHNOLOGY

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▶ ADVANCED OPTICAL SYSTEM

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There's plenty that's innovative in the new Avio 550/560 Max solutions. Here are just a few of the key optical technologies that set us apart:

- **Off-axis optics** for enhanced sensitivity
- **Free-form optics** to improve resolution and increase sensitivity
- **Proprietary optical coating** for great UV performance
- **Regulated optical temperatures** for improved performance

TECHNOLOGY

APPLICATIONS

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▶ HIGH PRECISION

HIGH PRECISION

High precision ICP-OES (HP-ICP-OES) provides unparalleled accuracy, with RSDs of 0.1% or less. It compensates for all sources of noise by measuring the internal standard at the same time as the analyte, for fully simultaneous measurements. HP-ICP-OES, available on the Avio 550/560 Max systems, is for labs requiring the highest levels of accuracy and precision.

TECHNOLOGY

APPLICATIONS

220 MAX

AVIO 220 MAX: TAKE EVERYDAY TO A NEW LEVEL

For some labs, sample volumes and workloads aren't an issue – but fast turnaround times on single- or multielemental analyses are still essential. For these labs, the intuitive, easy-to-use, hybrid-simultaneous Avio 220 Max system is simply the right choice. It's the plug-and-play, low-maintenance, high-uptime solution for small- to medium-size labs with big ambitions.

▶ HIGH THROUGHPUT



HIGH THROUGHPUT

Welcome to the world of **hybrid simultaneous ICP-OES**: The Avio 220 Max is the only ICP solution providing fast startup and simultaneous measurements, giving you all the throughput and flexibility you need for your workload. Plus, this plug-and-play instrument is simply the fastest ICP-OES from cold start to analysis in just 10 minutes. And with little or no maintenance for critical technologies, this is an ICP-OES that delivers exceptional uptime – and productivity.

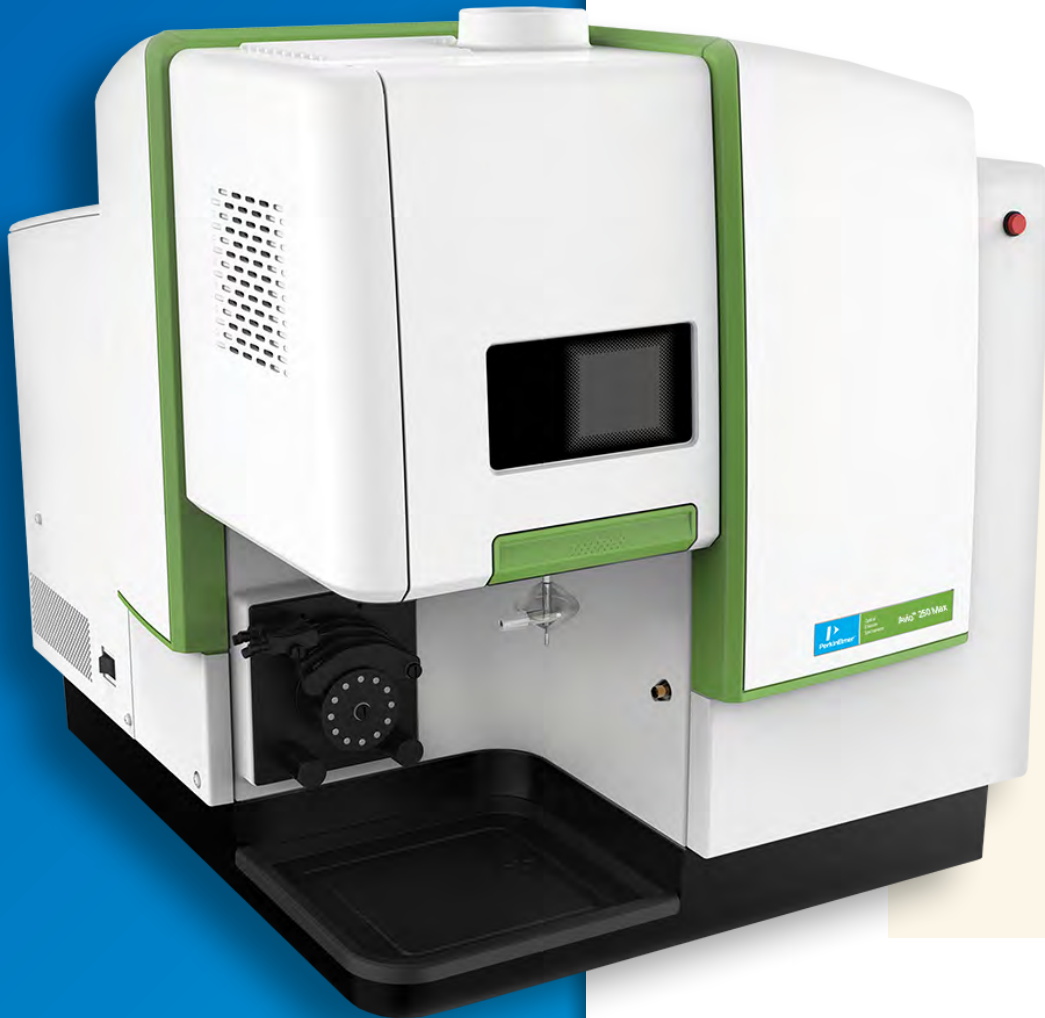
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▶ LOW COST OF OWNERSHIP

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Everything about the Avio 220 Max system is geared toward cost-efficient operation. Just like with all our Avio Max series systems, the Avio 220 Max boasts **torch mount** technology that enables you to adjust the torch as the instrument is operating for maximum performance. And the removable torch-independent injector simplifies maintenance and reduces cost.

Flat Plate plasma technology uses half the argon of other systems – a considerable cost savings – while generating a robust, matrix-tolerant plasma. Perpendicular flat-plate induction fields deliver a stable, symmetrical plasma, reducing maintenance and cooling requirements.

And **PlasmaShear interface removal** eliminates the need for a high-extraction system or cones while providing a fully automated, argon-free interference removal system.

TECHNOLOGY

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▶ SIMPLE TO USE

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The Avio 220 Max system allows you to run in **Attenuation mode**, reducing the signal by 90% without manual dilution, with just the press of a button. And it's customizable for every wavelength for maximum flexibility, enabling both high- and low-concentration elements in one analysis.

Plus, our **Syngistix software** mirrors your workflow, delivering a simple, intuitive, icon-based interface, with smart features to increase your uptime and ensure accurate results. And with smart methods, the system delivers fast, easy operation with minimal training.

[Click here to read more about Syngistix software.](#)

TECHNOLOGY

APPLICATIONS

THE SMART SOFTWARE FOR EVERY WORKFLOW

Our Avio Max series systems leverage the simple, powerful, intuitive, and *intelligent* Syngistix for ICP software, with workflows that walk you through every step of your analysis – from initial instrument setup to final results – for consistent, efficient, reliable operation. The software delivers:

- Intuitive user interface
- Built-in, smart methods for faster, easier method development
- Customizable user setup
- Extensive diagnostic monitoring to ensure instrument health and data quality

Syngistix software simply *works* with your workflow – with less intervention and a whole lot more uptime and productivity.

▶ SMART DATA



SMART DATA

With Syngistix software, you can control your data like never before, reviewing/editing calibration curves, relative standard deviation percentages, QC charting, and much more. The software delivers custom reporting and exporting templates with automatic exporting at the end of the analysis. And it even provides a color indicator for samples that are outside user-defined limits.

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▶ SMART MONITORING



SMART MONITORING

With Syngistix software, much of your QC monitoring and internal standards checking are performed automatically, with little or no manual intervention. Should a failure occur – including changes in nebulizer backpressure, extinguished plasma, or other hardware errors – you're informed in the Data Viewer and Results windows and through email, text, and an audible warning.

TECHNOLOGY

APPLICATIONS

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▶ SMART METHODS



SMART METHODS

All our Avio Max systems provide preset methods for faster, simpler operation and accurate, reliable data, cutting method development time in half. The Method Editor organizes parameters into logical groups and allows measurement times to be selected for faster, more productive development.

Our Avio 550/560 Max systems offers Universal Data Acquisition, enabling you to collect all the data for every sample, regardless of the elements specified in your analytical method. And you have the flexibility to determine the concentrations of elements not in the original method or those at alternate wavelengths – with no special analysis modes, fewer sample reruns, and no time or data-storage penalties.

What's more, Multicomponent Spectral Fitting provides simple, reliable interference removal in the most difficult samples by letting you isolate the analytical signal from the measured spectra for superior accuracy, precision, and detection limits.

TECHNOLOGY

APPLICATIONS

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▶ SMART COMPLIANCE



SMART COMPLIANCE

Any pharmaceutical company that wants to sell products in the United States must comply with FDA 21 CFR Part 11 requirements, ensuring data integrity and reliability during analytical testing. Our Avio Max systems help you meet those compliance goals with our Syngistix Enhanced Security™ software, providing data integrity through a secure database file structure and electronic records, audit trails, e-signatures, select user permissions, and more – everything you need to meet the technical requirements for 21 CFR Part 11 compliance.

TECHNOLOGY

APPLICATIONS

Environmental Testing

As with most environmental testing labs, fast turnaround and instrument uptime are critical to successfully process hundreds of samples per day. Labs need reliable instruments that promise high throughput and low maintenance. That's our Avio 550 and 560 Max systems.

Whether you're analyzing drinking water, wastewater, or soils, our fully simultaneous ICP – along with a built-in HTS on the Avio 560 Max – provides increased output, crunching sample times from a minute and a half to just 30 seconds for demanding multielemental applications.

With exceptional stability, low- to no-maintenance hardware, low argon consumption, and robust plasma, the Avio 550 and 560 Max systems are the perfect choice for labs like yours – challenged with increasing sample analysis without increasing budgets.

Plus, with Syngistix software, you'll benefit from real-time instrument diagnostics and smart results viewing to track sample analysis, QC, and internal standard performance – ensuring your results are accurate and error free.

Read our application note about the analysis of wastewaters following U.S. EPA 200.7.



TECHNOLOGY

APPLICATIONS

In-Service Lubricants Analyses

Hydraulics, transmission fluid, and gear and engine oils are all key components for keeping heavy machinery up and running smoothly. Analyzing these components gives a clear view of the health of a machine, which helps prevent breakdowns and costly repairs. And the earlier the detection, the more reliable the machine.

While many aspects of in-service oils need to be monitored, the metal content serves as a key indicator of the engine's condition. Our Avio 550 Max Oils is accurate and sensitive enough to detect the smallest trace amounts of wear metals, such as copper, iron, boron, and sodium, providing confidence in your results. You face unique challenges every day, and our customized solutions help you optimize your lab operations. Our cutting-edge instrumentation and turnkey systems – like the Avio 550 Max ICP-OES Oils system and OilPrep™ 8 oil diluter – help you get to accurate results faster.

Read our application note detailing the analysis of in-service oils following ASTM D5185.



For years, in-service oil and lubricant testing labs have had throughput, accuracy, and cost challenges. In the past, particle count and elemental analyses were conducted separately, requiring more time for sample preparation, analysis, and reporting. This also meant getting more samples up front and creating more waste on the back end. And, particle counting alone could take up to 20 minutes per sample. Now, all that has changed.

When it comes to particle count and elemental analysis, our proven patent-pending, two-in-one solution enables you to save time and improve workflows. The Avio Max 550 ICP-OES Oils system coupled with the LPC 500™ liquid particle counter allows you to measure metal content, as well as particle count and size, all in one run.

Read our application note to learn more about a novel approach to analyzing in-service lubricants for particle size/count and metal content.



TECHNOLOGY

APPLICATIONS

Geochemical Analysis

From infrastructure to automobiles to electronics, mined materials are vital to our way of life. Mining and metallurgical companies, academic institutions, and contract testing labs rigorously analyze geology and mining materials to ensure they're void of impurities and meet quality standards every step of the way.

Our Avio 550 and 560 Max ICP-OES systems can keep up with the ever-increasing sample volume in high-productivity labs like yours. Our fully simultaneous, dual-view, compact ICP-OES utilizes a vertical plasma, enabling you to handle your most difficult, high-matrix samples without dilution.

Plus, our Avio 560 Max solution features a built-in HTS, so you can reduce the time needed for sample uptake, stabilization, and washout – maximizing your productivity and optimizing your workflows.

Read our application note to learn more about using Multicomponent Spectral Fitting to resolve difficult interferences in metallurgical samples.



Read our application note about the analysis of impurities in lead using our Avio ICP-OES solutions.



Read our application note about high-precision analysis of battery materials by ICP-OES.



TECHNOLOGY

APPLICATIONS

Food Safety and Nutrients Testing

Safety and nutrition are of utmost importance when it comes to food analysis. And it's your goal to test as many samples as possible with precision and accuracy.

An ICP with reduced maintenance for complex sample matrices with high total dissolved solids (TDS), our Avio 550 and 560 Max fully simultaneous systems both feature built-in high-throughput screening and reduced start-up and analysis times. Our proprietary PlasmaShear interference-removal technology eliminates the need to clean cones and orifices, for reduced maintenance and increased uptime – perfect for fast-paced labs like yours. Plus, the Avio 560 Max features a built-in HTS system for even faster sample analysis.

Many research and development labs require daily instrument shutdown. These labs benefit from our Avio 220 Max – a hybrid simultaneous system that boasts reduced maintenance for high-TDS samples and quick startup in just 10 minutes.



Read our application note about early detection of chloride in 3-MCPD precursors in palm oil through the analysis of chloride in edible oils.



Read our application note about the determination of nutrients in animal feed in accordance with EN 15621.



TECHNOLOGY

APPLICATIONS

Pharmaceutical Testing

A critical consideration for pharmaceutical testing is ensuring your lab remains compliant with regulations such as 21 CFR Part 11. Don't worry – we've got you covered. Our Avio Max systems help you comply thanks to Syngistix Enhanced Security software through data integrity with secure database file structure and electronic records, audit trails, e-signatures, select user permissions, as well as other features.

There's so much more to successful pharmaceutical analysis – handling complex samples, increasing your throughput, streamlining workflows – and our fully simultaneous Avio 550 and 560 systems can help you get there. With PlasmaShear technology, you can say goodbye to tedious tasks such as cleaning cones and orifices for high-TDS samples. Plus, the Avio 560 Max includes a built-in HTS system for even faster sample analysis.

And for labs with intermittent sample analysis needs, or cost-conscious ones, the Avio 220 Max allows multiple daily shutdowns with lightning-fast startup in 10 minutes, so you can go from cold start to sample analysis to results faster than ever before.

Read our application note to learn about analyzing allergy medications using ICP-OES following USP 232/233 guidelines with software designed to aid in 21 CFR Part 11 compliance.



Learn more about the analysis of SiO₂- and TiO₂-containing medications using ICP-OES following USP 232/233 guidelines with software designed to aid in 21 CFR Part 11 compliance.

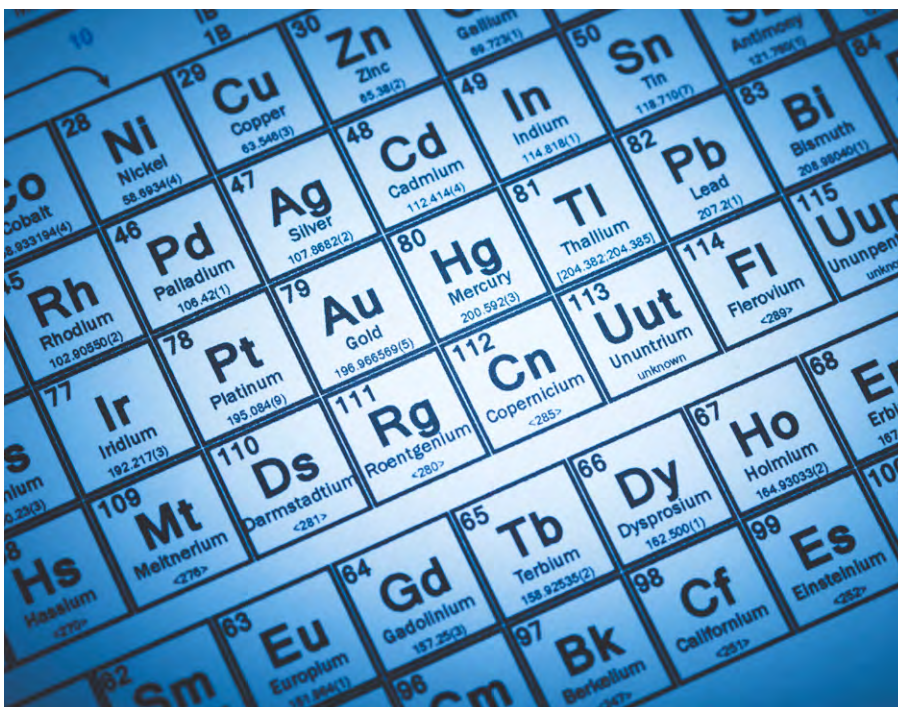


TECHNOLOGY

APPLICATIONS

PRECISION-ENGINEERED CONSUMABLES

The consumables for our Avio Max series ICP-OES are designed with your instrument in mind, with each fit to perform and manufactured with the highest quality materials available. Whether you're looking for sample introduction components or standards, we have the consumables you need to keep your Avio Max instrument up and running smoothly and efficiently.



TECHNOLOGY

APPLICATIONS

COMPLETE SERVICES FOR INCREASED PRODUCTIVITY AND EFFICIENCY



Today's lab leaders are facing several challenges, from tighter deadlines to increased budget scrutiny to teams with various degrees of comfort with lab equipment. Time that could be spent getting ahead is spent on noncore activities.

To help you overcome barriers to success, OneSource® Laboratory Services has built a team of trained scientists and engineers who bring their real-life knowledge to you, helping increase your productivity with recommendations on how to best utilize your assets. With this knowledge, you can get back to your core mission.

Labs of all sizes need to know their equipment will work as expected, every time they turn it on. From contracts and performance maintenance available for our instruments as well as other manufacturers' equipment to full lab asset management delivered globally, we can help you make the most of your important lab assets.

And for labs looking to introduce new equipment and techniques, we offer training at our facilities and yours.

INSTRUMENT SUPPORT SERVICES

Maintaining labs is never easy, especially when an instrument is down. We know you're responsible for the performance of your laboratory, and we make sure nothing holds you back. With the quickest response times and highest first-time fix rates, our field service engineers, manufacturing site technical service, and research and development teams are here at your disposal to ensure maximum uptime.

You need your instruments to be reliable and running with minimal downtime, and you want flexible service agreements that are easy to comprehend. We understand, and we're here to help.

COMPLIANCE SERVICES

Navigating the complexities of regulations can be difficult for even the most efficient laboratories. OneSource compliance services can help relieve the burden of compliance and free up more time for your core activities. With our consultative approach we can help identify gaps in data integrity and compliance of your lab instruments and systems.

OneSource offers the most robust range of compliance products and services for each stage of the instrument lifecycle. From commissioning, qualification, and computer system validation, to periodic OQ, and even system retirement activities – OneSource has your lab's compliance covered.

EDUCATION SERVICES

Whether you are looking for a basic instrument refresher course, simple troubleshooting techniques, general application support, or method optimization, our field application scientists or service engineers will come directly to your lab. Through education, you will gain knowledge and insights into the latest techniques, not only increasing your confidence, but also unlocking the full potential of your instrument.

TECHNOLOGY

APPLICATIONS



SMARTER QUESTIONS FASTER ANSWERS

Looking for industry-leading informatics software? Or to overcome challenges like volatile pricing, increased environmental regulation, and data complexity? Browse our suite of informatics software and improve collaboration, spark R&D innovation, and deliver predictive analytics in real time.



The world's most trusted chemical research application, ChemDraw accelerates the creation and communication of chemistry reports, leverages smart functions to generate chemical structures, and integrates with key research literature and chemical-safety databases.



Quickly analyze disparate data from multiple sources and create a complete picture of what's happening in real time. This software will completely transform the way you work, allowing you to connect data sources and uncover new insights – all within minutes.

TECHNOLOGY

APPLICATIONS

[For more information visit www.perkinelmer.com/AvioMax](http://www.perkinelmer.com/AvioMax)

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