A GAME CHANGER IN LABORATORY WORKFLOW

LPC 500™ Liquid Particle Counter and
Avio® 500 ICP-OES Oils Hyphenated System

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AN END-TO-END SOLUTION FOR A SMOOTH-WORKING LAB

In-service oil and lubricant testing labs like yours are all faced with the same challenges – increasing throughput, improving accuracy, and controlling operating costs. What if there was a way to reach your goals and totally change the way you work? Now there is.

In the past, particle count and elemental analyses were conducted separately requiring more time for sample preparation, analysis, and reporting. More sample was required up front; more waste was made on the back end. Plus, particle count analysis alone could take up to 20 minutes per sample. Today, our patent-pending integrated solution is a game changer in laboratory workflow that considerably improves operating costs.

Our **LPC 500 liquid particle counter** coupled with the proven **Avio 500 ICP-OES Oils system** enables the same diluted sample to be analyzed for both multielement determination as well as particle count and size. This innovative technology allows you to perform both analyses in one run, at an average of 45 seconds per sample, and with less than 1 mL of sample.

Now *that's* a game changer.

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TWO TESTS, ONE RUN

Simplify your science with better analysis in less time

When it comes to lubricant analysis, your biggest challenge might be testing for wear and additive metals *and* particle count analysis. But if your lab is like most, your standalone particle count technologies are slow and cumbersome. Plus, they require a lot of sample and generate more waste.

Our end-to-end solution combines both analyses in one run. How's *that* for efficient? Here's how it works.

STEP ONE

OilPrep™ 8 Oil Diluter

Dilutes oil samples in preparation for wear metals and particle counting analyses.

BENEFITS:
Improves productivity and efficiency, delivers flexibility to access your original sample, and saves time.

STEP TWO

Oils 7400 Dual Autosampler with Particle Xpress

Stirs samples with particulates prior to sampling and analysis.

BENEFITS:
Increases sample throughput; provides sample-to-sample reproducibility through syringe-driven fluidics.

STEPS THREE AND FOUR

LPC 500™ Liquid Particle Counter with Avio® 500 ICP-OES Oils System

Coupled together, they perform particle count and wear/additive metals analysis in one run.

BENEFITS:
Increases throughput, reduces sample volume and waste, and saves laboratory space.

STEP FIVE

Syngistix™ for ICP Software

Handles reporting for both elemental analysis and particle counting.

BENEFITS:
Improves efficiency with an intuitive interface, quick and easy method setup, and the flexibility to choose between various reporting formats.

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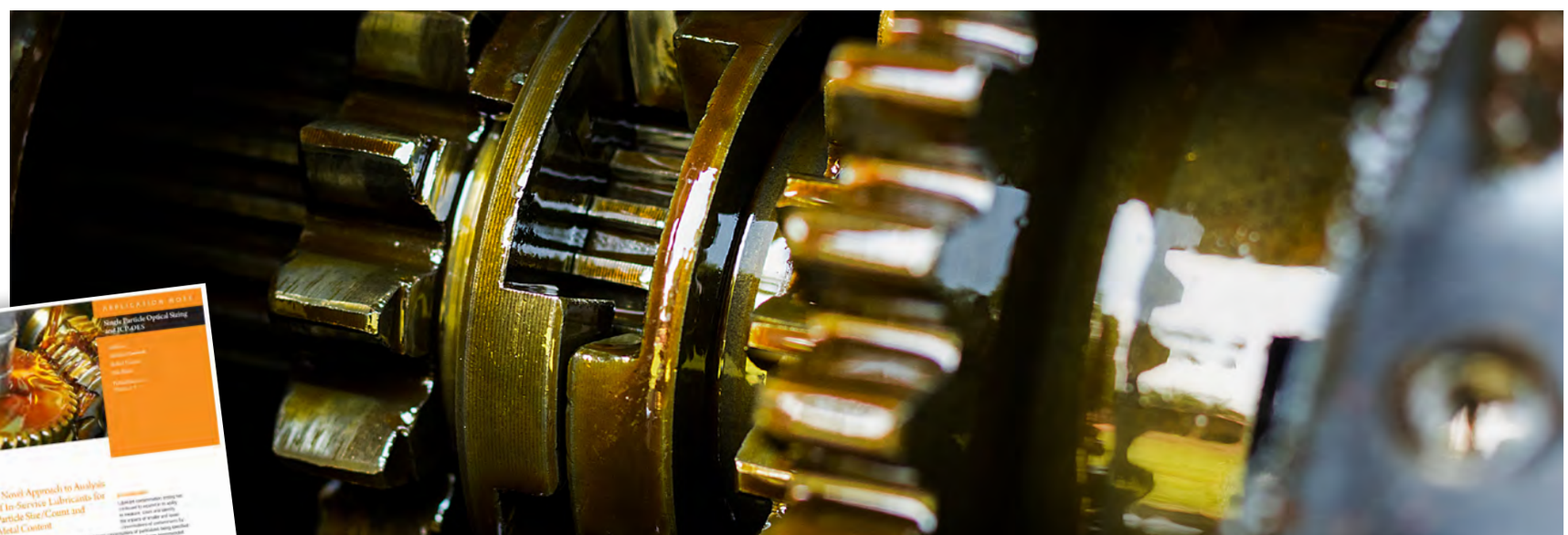
DISCOVERY STARTS WITH INNOVATION

Analyzing wear metals and particles in one run

In-service lubricant testing labs like yours are measuring, counting, and identifying the impacts of smaller and lower concentrations of contaminants for in-service lubricants every day. Often, particle count is also performed to monitor and identify particles of certain sizes and concentrations that can contribute to machine failure.

So how can our patent-pending, two-in-one solution work for you? It's simple, yet genius. By adding the LPC 500 liquid particle counter in-line with the Avio 500 ICP-OES Oils system, lubricant samples can be analyzed for both wear metals and particles all in one run. That means higher throughput and more accurate results in less time.



Read our application note to learn more about measuring, counting, and identifying the impacts of smaller and lower concentrations of contaminants for in-service lubricants.

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THE BENEFITS OF OUR INTEGRATED SOLUTION

TWO analyses, ONE run, ZERO manual intervention

In the world of oil condition monitoring, two separate, critical analyses must be performed. Our patent-pending hyphenated **LPC 500 liquid particle counter** and reliable **Avio 500 ICP-OES Oils system** let you test both in one run.

Avio 500 ICP-OES Oils System

- Vertical plasma torch ensures fast, stable operation, dependable results and low cost per analysis
- Patented Flat Plate™ plasma technology uses half the argon of load-coil systems with same robust plasma
- Simultaneously collects data on more than 73 elements (UV and visible wavelengths) in seconds for exceptional sample throughput

Syngistix for ICP Software

- Workflow-based interface designed to improve efficiencies in the lab
- Particle counting can be enabled or disabled from method to method
- Various reporting formats and particle count sizes can be selected for added flexibility

LPC 500 Liquid Particle Counter

- Particle counting and sizing rates in excess of 10,000 particles per second
- Smallest automated particle counter footprint in the industry
- Connects seamlessly with ICP-OES for elemental analysis

Patent-Pending Hyphenated Solution

- Two analyses, one run – with single sample preparation
- Sample-to-sample analysis in under 45 seconds
- Uses less than 1 mL of lubricant sample per analysis
- Generates less waste for the laboratory

Watch a Demo
Click here to watch a video and learn more about how our hyphenated system works.

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LPC 500 Liquid Particle Counter

For particle counting and sizing

Our innovative and efficient single particle optical sizing (SPOS) technology is engineered to detect individual particles passing through a very thin optical-sensing zone. It offers reproducible results between high- and low-viscosity samples while minimizing washout requirements and solvent waste.

The **LPC 500 system** comprises three components: optical sensor, multi-channel pulse analyzer (MPA), and software controller. Read more about the benefits of each.

Optical Sensor

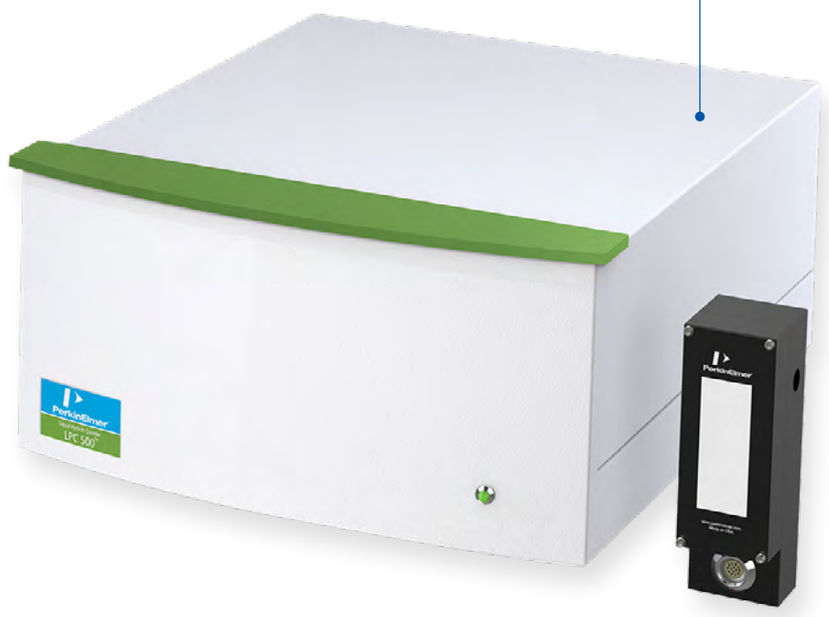
Using two methods – light extinction (LE) and light scattering (LS) – you can detect individual particles in a certain size range as each pass through the optical-sensing zone.

Multi-Channel Pulse Analyzer (MPA)

Detect each pulse produced by the optical sensor, measure its height, and determine the particle diameter associated with this value by fast interpolation between points in the sensor calibration curve.

Software Controller

All features and data outputs have been integrated into Syngistix for ICP software, empowering you to improve efficiencies in the lab and enable or disable particle counting from method to method.



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Avio 500 ICP-OES Oils System

For wear and additive metals analysis

For high-throughput labs testing in-service oils, the **Avio 500 ICP-OES Oils system** provides insights into the health of the engine.

A simultaneous, dual-view, compact ICP-OES, this system utilizes a vertical plasma, and it's engineered to handle even the most difficult, high-matrix samples without dilution, delivering productivity, performance, and faster return on investment. Benefits include:

- **Vertical plasma torch** ensures fast, stable operation, dependable results, and low cost per analysis
- **Patented Flat Plate™ plasma technology** uses half the argon of load-coil systems with the same robust plasma
- **Advanced optical system** simultaneously collects data on more than 73 elements (UV and visible wavelengths) in a matter of seconds for exceptional sample throughput
- **PlasmaShear™ maintenance-free interference removal** effectively, reliably, and economically eliminates interferences by removing the cool tail plume of the plasma—without using argon
- **PlasmaCam™ viewing camera** offers continuous viewing of the plasma, simplifying method development and enabling remote diagnostic capabilities
- **Radian™ remote monitoring** provides real-time monitoring of your system's diagnostic parameters, maximizing uptime
- **Compact design** saves valuable laboratory bench space
- **Complies** with ASTM D5185, D4951, D6130

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OilPrep Oil Diluters

For particle counting and wear metals sample preparation

The OilPrep series of oil diluters automatically dilutes samples with kerosene (V-Solv™), in preparation for elemental analysis (by ICP-OES) and particle analysis (by SPOS), such as with the **Avio 500 ICP-OES Oils system** and **LPC 500 liquid particle counter**. Benefits include:

- **High throughput** – Significantly improve productivity and efficiency versus manual or single-tip systems.
- **Flexibility** – Innovative Varispan® technology provides automatic computer-controlled variable sample probe spacing for multi-tipped processing of original sample containers.
- **Time savings** – Unlike alternate technologies, PerkinElmer's Ultrasonic Liquid Level Sensing is not impacted by individual sample viscosities, color, or external lighting.
- **Reduced solvent waste** – Use of disposable tips eliminates time-consuming tip-wash steps required with fixed-tip systems, accelerating throughput and significantly reducing the volume of waste solvent.
- **Minimized cross contamination** – Use of disposable pipette tips also minimizes cross contamination reducing false-positive results that require significant time and expense to retest.
- **Optimized workflows** – Easy-to-use WinPREP® software allows user flexibility in choosing vessel types (vials, bottles, tubes), assay setup, and provides potential for fully automated (analytical) integrations.

OilPrep 8

OilPrep 8

- Diluting up to 500 samples per hour, one OilPrep 8 oil diluter can prepare approximately 4000 samples in 8 hours.

OilPrep 4

OilPrep 4

- Diluting up to 250 samples per hour, one OilPrep 4 oil diluter can prepare approximately 2000 samples in 8 hours.
- Can be upgraded to an OilExpress™ 4 Oil Condition Monitoring System to provide FT-IR analysis and oil dilution in a single platform.

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Syngistix Software

Easy to learn, easy to use, and easy to love

Syngistix for ICP is a workflow-based software featuring a unique icon-based design that simplifies navigation and walks the user through every analysis – from setting up to acquiring data to reporting results.

This intuitive, user-friendly software brings efficiency and harmony to your lab. All features and data outputs for the LPC 500 system have been integrated so you get feedback in real time, every time.

Particle counting can be enabled or disabled from method to method, and various reporting formats and particle count sizes can be selected for added flexibility. Now that's efficient.

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OneSource Laboratory Services

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 at yours.

OneSource® Laboratory Services

- Asset optimization
- Lab environment and instrument monitoring
- Asset location
- Education and training
- Technology and descriptive analysis
- IoLT/Lab of the future
- Remote support
- Multivendor services
- Compliance
- Lab support
- IT solutions
- Instrument qualifications

Read about our multivendor and educational services

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Multivendor Services

With so many different vendors' instruments in your lab, it can be challenging to ensure everything is being maintained properly. Some labs struggle to get the most productivity and efficiency from all their instruments. Others streamline and simplify workflows to maintain regulatory compliance – and reduce the risk of noncompliance. Either way, you're always scrambling to figure out whom to call for service as quickly as possible before you lose too much time…and money.

But what if there were a one-stop service contract option for your lab – from a company with decades of deep-seated multivendor experience – that repaired all your instruments, offered state-of-the-art validation and compliance services, and provided reliable preventative maintenance? There is. That's what OneSource Multivendor Service is all about.

Educational 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.

OneSource® Laboratory Services

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Informatics

Smarter questions, faster answers

Looking for industry-leading informatics software? Yeah, we've got that, too. 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.

ChemDraw

Accelerate the drawing and publishing of chemical and biological compounds. With handy shortcuts, hotkeys, time-saving chemical intelligence, and publication-worthy graphical templates, you'll have more time for what matters - your science.

TIBCO Spotfire®

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 disparate data sources and uncover new insights – all within minutes.

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Consumables

Get the most out of your instruments *and* your analysis

You invest great efforts into your research – and we do the same with our consumables and accessories, tested and validated to fit your lubricant analysis needs. That's why we developed a full range of quality consumables like V-Solv™ ICP solvent, particle count verification fluid, and particle count calibration fluid designed only for lubricant analysis.

Browse our consumables portfolio for products that offer reliable performance, control of operating costs, and maximized uptime of your instruments. Like our trusted instruments, our consumables offer the best performance over and over.

Choose the right consumables for your analysis today.

Sample Probe for Particle Applications

The particle sample probe is a clog-free probe that eliminates bubble formation. It is designed with the same internal diameter throughout the length of the probe allowing for flow-rate consistency, ideal for particle count analysis.

Benefits include:

- Easily interchangeable
- Reduces clogging
- Easy to clean

Metallo-Organic Standards

High-quality reference materials are essential for accurate analytical measurement and quality control, ensuring sound decisions are made based on reliable data.

Our metallo-organic standards have been designed to give you the confidence you need when analyzing difficult samples.

HybridXLT Organics Torch

Our HybridXLT™ 3-slot torch, an exclusive design only available from PerkinElmer, provides the highest performance for your Avio ICP-OES spectrometer and is ideal for in-service lubricant testing applications.

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For more information on our lubricant testing solutions, visit www.perkinelmer.com/lubricants

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