



THE SMOOTH OPERATION OF THE EFFICIENT LAB

LUBRICANT TESTING SOLUTIONS





KEEP YOUR LAB IN MOTION

We all know when things run smoothly, everybody wins. With that in mind, we've created simple and reliable solutions – from instruments and accessories to software to service and support – that increase uptime, maximize lab efficiency, grow your ROI, and ensure customer satisfaction through advanced lubricant analysis tools and techniques.

Analyzing lubricants is paramount in making sure they meet safety and quality standards. As leaders in the industry, we've been providing robust, easy-to-use testing solutions for more than 60 years. We're not about to slow down now. Our experience and expertise with global organizations – and insights from customers like you – help us enable you to improve the flow of your lab, increasing your throughput and value to customers.

Not only do lubricants keep machines moving efficiently, but our lubricant testing solutions keep your lab running smoothly, too.



WHERE ACCURACY AND CONFIDENCE MEET



Hydraulics, transmission fluid, 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 solutions are accurate and sensitive enough to detect the smallest trace amounts of wear metals, such as copper, iron, boron, and sodium, providing you with confident 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 **Avio® 500 ICP-OES Oils system** and **OilPrep™ 8 oil diluter** – help you get to accurate results faster.

Avio 500



Learn more about our ICP-OES oils system for high-throughput labs testing in-service oils

OilPrep 8



Learn more about our 8-tip oil dilution system



A GAME CHANGER IN LABORATORY WORKFLOW

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. We've developed a patent-pending two-in-one technology using our proven **Avio® 500 ICP-OES Oils system** coupled with the **LPC 500™ liquid particle counter**. It allows you to analyze elements and particle count and size in one run. Plus, with less than 1 mL of sample and an average speed of 45 seconds per sample, this process results in improved workflow and lower operating costs.

Avio 500 with LPC 500



Learn more about our two-in-one system



FAST, RELIABLE, IN-DEPTH ANALYSIS

Monitoring oil condition for contamination (soot, water, glycol, unburned fuel), chemical degradation (oxidation, nitration, sulphur compounds, ester breakdown) or additive depletion is crucial to prevent lubricant failure and costly equipment damage.

For lubricant chemistry and condition monitoring, our **Spectrum Two™ FT-IR** and **OilExpress™** systems provide a rugged, scalable, automated, high-throughput solution that minimizes downtime and improves lab productivity with fast, accurate analysis of in-service lubricants. Our complete solution ensures you have access to consumables, training, and service and support right at your fingertips.

Spectrum Two



Learn more about our FT-IR spectrometer dedicated to in-service lubricant analysis

OilExpress 4



Learn more about our condition monitoring system



RELIABLE AND ROBUST ANALYSIS

Imagine doing more in less time. Now imagine quality and accuracy didn't have to suffer as a result. Too good to be true? It's not.

Our automated **Clarus® GC systems** provide analytical options for the determination of contamination of in-service oils like gasoline, diesel, and biodiesel. Boasting the fastest injection-to-injection time, the Clarus 690 GC will boost your productivity and improve your ROI.

When the Clarus GC is paired with our **TurboMatrix™ Headspace sampler**, it enables you to quantify fuel and coolant contaminants in oil accurately and efficiently. Simply put, it's the fast, simple, rugged solution that delivers ultimate productivity, versatility, sensitivity, and analytical precision.

Clarus 690



Learn more about our gas chromatograph

TurboMatrix



Learn more about our automated headspace sampler

INNOVATION THAT PUSHES YOU FORWARD

Whether you're performing wear and additive metals analysis, particle count and elemental analysis, lubricant chemistry, or contamination testing, our trusted solutions help you achieve accurate results in record time – because when your lab runs smoothly, you can concentrate on science.

FOR WEAR AND ADDITIVE METALS ANALYSIS



Avio 500 ICP-OES Oils System

For high-throughput labs testing in-service oils, the Avio 500 ICP-OES Oils system provides actionable recommendations about the health of the machinery. A simultaneous, dual view, compact ICP-OES, it 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. Key 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
- Simultaneously collects data on more than 73 elements (UV and visible wavelengths) in seconds for exceptional sample throughput
- Compact design saves valuable laboratory bench space
- Complies with ASTM D5185, D4951, D6130

FOR PARTICLE COUNT AND ELEMENTAL ANALYSIS



Avio 500 ICP-OES System with LPC 500 Liquid Particle Counter

When you couple the Avio 500 ICP-OES Oils system with the LPC 500 liquid particle counter, it becomes a two-in-one system, that can test for particles *and* elements in lubricants. Together they provide a reliable end-to-end solution that saves you time and money. Key benefits include:

- Improved sample throughput (~45 sec from sample to sample versus >5 mins)
- Reduced sample size (<1 mL for particle count versus 20 mL to 30 mL for standard particle count)
- Simple to use with easier data reporting
- Generates less waste for the laboratory

TECHNOLOGIES

FOR WEAR METALS AND PARTICLE COUNTING SAMPLE PREPARATION



OilPrep 8 Oil Diluter

Our OilPrep 8 is a dedicated 8-tip oil diluter that automatically dilutes samples with kerosene (V-Solv™), in preparation for elemental analysis (ICP-OES) and single-particle optical sensing (SPOS), such as with the Avio 500 ICP-OES Oils system and the LPC 500 liquid particle counter. Key benefits include:

- Pipettes eight samples simultaneously, improving laboratory productivity and efficiency
- 8-tip Varispan® arm allows the flexibility to sample from either tubes or bottles
- Ultrasonic Liquid-Level Sensing technology provides unattended dilution of samples of variable volume, saving time
- Disposable pipette tips minimize cross contamination and eliminate tip washing
- Easy-to-use software features predefined pipetting templates for optimized workflows

FOR LUBRICANT CHEMISTRY



Spectrum Two Lubricant Analysis System

The Spectrum Two system is a robust and compact FT-IR spectrometer that offers trouble-free analysis of in-service lubricants, including mineral and synthetic oils, petroleum hydraulic fluids, and turbine fluids. Its intuitive design and dedicated in-service lubricants analysis protocols enable novice and experienced users alike to generate clear, high-quality results. Key benefits include:

- User-friendly design suited for demanding quantitative applications
- Clear, high-quality results, regardless of the level of expertise
- The ability to get your lab up and running faster



OilExpress 4 Oil Condition Monitoring System

OilExpress 4 provides highly automated, rapid and reliable oil-condition monitoring results for high-throughput laboratories dealing with a wide range of viscosities. Our unmatched quality of FT-IR analysis is backed by a comprehensive offering of technical support and services across the globe. Key benefits include:

- Automated FT-IR analysis of oils
- Detection of degradation and contamination properties of lubricating fluids
- Provides undiluted samples of used oil to the Spectrum Two FT-IR
- Sample throughput of up to 100 samples per hour
- Complies with JOAP, ASTM E2412, and ASTM D7418

FOR FUEL AND COOLANT CONTAMINATION TESTING



Clarus 690 GC

Delivering superior levels of productivity and sensitivity, the Clarus 690 GC offers limited carryover and simple operation and maintenance, enabling rapid sample throughput and results you can count on. Our automated GC system provides analysis for fuel contamination of in-service oils, including gasoline, diesel, and biodiesel. Best-in-class injection-to-injection time boosts productivity and increases return on investment. Couple that with our TurboMatrix solutions, and you have options for headspace (HS), manual and automated thermal desorption (TD, ATD), and a flexible multiprep autosampler for liquid sampling and SPME. Key benefits include:

- ASTM D7593 compliant
- Fast fuel analysis using our unique PreVent backflush technology
- Robust, integrated liquid autosampler that provides reliability with small sample sizes
- Deeper, more specific insights into the state of your oil
- Detection of potentially damaging compounds
- Precise results on fuel or coolant contamination levels
- More precise and effective scheduling of preventative maintenance



TurboMatrix Headspace

Our TurboMatrix HS sampler offers productivity, versatility, and sensitivity. With simultaneous, automated 12-sample thermostating, it provides faster analysis times and dramatic cost saving. And unattended processing of up to 110 vials increases sample throughput. Key benefits include:

- Innovative pressure-balanced, time-based sampling for superior precision and more reproducible results
- Full automation with programmable shutdown and wakeup modes for unattended operation
- Touchscreen graphical user interface providing fast, easy analysis
- 12-position oven delivering uniform heat distribution for precise thermostating and higher throughput

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 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.



Avio ICP-OES Torch



High Quality Autosampler Tubes



Certified Metallo-Organic Standards



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.

Signals™ Notebook

A cloud-native electronic lab notebook that captures, reuses, and shares experimental data.

E-Notebook™

Document analyses and leverage the knowledge gained from previous experiments.

Lead Discovery

Discover actionable insights by seamlessly integrating chemical and biological molecules with activity results.

TIBCO Spotfire®

Quickly analyze disparate data from multiple sources and create a complete picture of what's happening in real time.

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 utilized 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 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

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.

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

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



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

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