



## Excellence in Education Facilitated by Robust ICP-OES Analysis

In the past, operational cost of ICP-OES instruments made it difficult for universities to purchase, due to limited budgets and intermittent use. However, the PerkinElmer's Avio® 200 ICP-OES overcomes this barrier with new technology dramatically reducing the cost of operation for research and low throughput laboratories. When not in regular use, it is common to power down analytical instruments to save electricity. However, the warmup time after powering on is generally 1-2 hours, the time required to thermally stabilize the optics. But the unique optical design of the Avio 200 only requires a 10-minute warmup when powered on – perfect for an academic setting where the instrument will see intermittent use throughout a day or month. Combined with the low argon consumption while in operation (a total of 9 L/min) resulting from the flat-plate design, the Avio 200 is the perfect instrument for universities to use in both teaching and research scenarios.

"The robustness, stability and sensitivity of the Flat Plate Technology Plasma was really impressive", explains Assistant Professor Kristin Kvamme, Department of Safety, Chemistry and Biomedical Laboratory Sciences, Western Norway University of Applied Sciences (HVL). "We were one of the first higher educational institutions that got Flat Plate Plasma Technology into our curriculum as compared to traditional load coil designs". Adding value to their program, the Avio provides students with the opportunity to develop relevant analytical skills.

### Affordable ICP Analysis with Avio 200

It is a major challenge for academic institutions to fund the operation of an ICP-OES instrument within the limited budgets available. Traditional ICP-OES instruments are not cost efficient, especially when sample throughput is low and the instrument is not operational 8 hours a day. Alternatively, if the ICP-OES is turned off totally to save the gas purge in an effort to reduce operating costs, it takes hours to restart. This is because the optics need to be thermally stabilized, and the detectors cooled, before samples can be introduced and valuable teaching time is lost.

The Avio 200 instrument removes all of these challenges, thus offering an affordable solution for ICP-OES analysis. The Department of Safety, Chemistry and Biomedical Laboratory Sciences' Head Engineer Torun Synnøve Skøld, "We need quick start up, and the Dynamic Wavelength Stabilization of Avio 200 is truly unique. From fully off (no power or standby) to operational plasma in 10 minutes."

*"The sensitivity of the Avio 200 ICP-OES is fantastic. We get on our unit over 15 million counts per second for 1 ppm of Mn, making it a really versatile tool for research. In addition, it is possible to operate individual lines in "reduced sensitivity" mode where it runs at sensitivities closer to other ICP's. In this way we can work over extreme concentration ranges: High sensitivity, normal sensitivity, axial and radial".*

**Assistant Professor Kristin Kvamme**  
Western Norway University of Applied Sciences (HVL)



From an analytical perspective, the Avio 200 ICP-OES has extended linear range with dual viewing technology for optimal viewing. It has no limitations neither to the axial or the radial view, delivering an extended linear dynamic range which can minimize sample preparation and dilution.

*"With the intelligent individual reading height of each element, ionization interferences can be elegantly avoided without adding cumbersome and expensive ionization buffers. This is also great to demonstrate in lab-exercises for the students".*

**Assistant Professor Kristin Kvamme**  
Western Norway University of Applied Sciences (HVL)

### Reproducible Results Regardless of Experience

The "history" of the sample introduction system might compromise the quality of the data for the next user. This is a particular challenge when many different, inexperienced operators use a single instrument for a variety of projects. This problem is solved very intelligently on the Avio 200 ICP-OES as the design allows for easy cleaning. The whole sample introduction system can be removed and swapped with another in less than a minute! No tools are required regardless of whether you change just the torch, the nebulizer/spray chamber and injector, or the whole assembly. In addition, the unique argon-free Plasma Shear removes the cool tail of the plasma, eliminating self-absorption and matrix deposition on the interface, further simplifying operation, minimizing maintenance, and delivering reliability. In this way, the next generation of scientists at Western Norway University of Applied Sciences (HVL) can use the Avio 200 for learning, while sample introduction systems can be swapped out for dedicated projects or specific applications.

*"The Syngistix software is very user-friendly; all the flexibility needed for the research while at the same time so easy to use that students in the analytical training course pick it up intuitively."*

**Torun Synnøve Skøld**  
Head Engineer  
Western Norway University of Applied Sciences (HVL)



### Benefits of Avio 200 ICP-OES System:

- Economical ICP-OES analysis through our proprietary Flat Plate™ plasma technology which generates a robust, matrix-tolerant plasma using half the argon of other systems to give you superior uptime and productivity and a faster return on investment.
- The optimizable dual view enables both axial and radial viewing; it is like having two instruments in one. There are no limitations as the viewing height of the plasma can be adjusted.
- Simplified method development and convenience through remote monitoring using the Avio 200 system's PlasmaCam™ technology. You can view the plasma in real time, perform remote diagnostics and view sample introduction components.
- An intuitive, cross-platform Syngistix™ software, unique to PerkinElmer atomic spectroscopy instruments. Features left-to-right, icon-based design, built-in preset methods for faster and easier operation. Designed to mirror your workflow, the interface walks you through every step of analysis. Minimal training required.
- Reduced running costs as the Dynamic Wavelength Stabilization makes it possible to start collecting data shortly after igniting plasma, reducing gas consumption.
- Maximum instrument uptime with low maintenance with an integrated and automated interference-removal system that delivers problem-free axial analysis. And, it is very easy to switch between users and sample matrices.

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