

# Clinical Osmometers: Meeting the Increasing Need for Workflow Efficiency

**In a Clinical Laboratory, Osmometers Need to Deliver Quick, Accurate and Precise Results While Perfectly Integrating Into an Efficient Workflow.**



**"We're thinking about more than just accuracy and precision when we think about our instruments. Those features are non-negotiable. We think about the whole solution—we want to be the solution for the entire clinical ecosystem."**

Julie MacKenzie, Senior Manager, Clinical Product Portfolio at Advanced Instruments

In today's environment, clinical laboratories are challenged like never before to deliver the accurate and timely results clinicians need in a secure manner despite sometimes limited resources. To support them, Advanced Instruments, as a manufacturer of analytical instruments, is constantly working on designing innovative systems which can provide time-saving workflow features, optimize processes and increase safety all the while maintaining strict security and regulatory compliance. The goal: Help labs do more with less.



## Osmolality: An Inexpensive Test Providing Critical Information

Among the parameters routinely measured in clinical laboratories, osmolality plays a key role. In fact, osmolality is an essential test required to investigate the underlying pathophysiology of many diseases such as hyponatraemia, small-molecule poisoning and even viral infections such as COVID-19<sup>1</sup>. "Osmolality is an inexpensive test that provides a tremendous amount of information in the clinical setting," MacKenzie notes. "I love it because it is not a specific analyte. I'm not looking only for a sodium concentration or potassium concentration. I get an overall concentration, which gives me profound insights into what is happening in the body."

As a result, osmolality measurement is pivotal for making quick diagnoses of potentially life-threatening conditions, and thus

improving treatment and patient outcome. Given the high clinical value of measured osmolality testing, it is key for clinical labs to optimize their analytical workflow and provide the full range of accurate information that physicians need without delays. In this situation, many factors need to be considered when choosing the most suitable instrument for a lab.

These criteria include:

- Performance
- Calibration frequency
- Power cycling, and life time
- Ease of use
- Data storage
- Level of automation



## Osmo1® Single-Sample Micro-Osmometer

### Performance: Are You Concerned About Your Instrument's Specifications?

Freezing point osmometers perform measurement over the clinically relevant range of osmolality. These measurements need to be extremely accurate, especially in the clinically relevant range, since even small shifts in osmolality values can have a diagnostic relevance. As well, in order to limit costs, instruments have to deliver high performance analysis with small sample volumes. The Osmo1® Single-Sample Osmometer, for example, requires only 20 $\mu$ L of sample for one test. Moreover, small changes in ambient temperature (<5 °C) should not impact the instrument's performance. "Performance is a crucial factor," adds MacKenzie. "When you need half the sample volume for one instrument in order to get the same performance as you would with a different instrument, you can save the sample. This could be used for other tests, and therefore you also save money."

### Calibration Frequency: Would Performing Fewer Calibrations Have an Impact on Your Lab?

Calibration frequency has a big effect on the efficiency of an instrument. Frequent calibrations require additional labor and increase the expenses for consumables. "The number of hours spent calibrating has a profound impact on efficiency in a lab," notes MacKenzie. "If, for example, you have to calibrate your instrument every day, it will take you approximately one hour a day. That makes 360 hours in a year. However, if you need to calibrate your instrument only twice a year, you will use just 2 hours in a year. This makes a big difference in the number of hours spent calibrating, which translates to time and labor savings." Advanced Instruments osmometers require minimal recalibration (as infrequent as every 6 months), therefore allowing technicians to invest their time in other pertinent tasks.





## Power Cycling and Instrument Life-Time: Are You Worried About the Useful Life of Your Osmometer?

Clinical laboratories need to perform tests and report results around the clock. However, some freezing-point osmometers need to be powered off at least once every 24 hours (power cycled) due to the excess formation of ice crystals or moisture, which can introduce contamination or cause the system to freeze up. This downtime results in reduced efficiency.

"Advanced instruments osmometers are designed to be always on, so you do not need to be," comments MacKenzie. "You turn them on, and you leave them on, they have no or minimal downtime. Moreover, they are extremely robust."

## Ease of Use: With Staffing Shortages, Would a Simpler Technique Simplify Your Workflow and Make It Easier To Train New Technicians?

A key factor to consider when buying a new instrument is the time needed to learn how to use the instrument, operate the instrument and clean it. User-friendly features can have a major impact on productivity. Intuitive touch screens, for example, make instruments much easier to operate than LCD displays. Technicians can enter their user ID and then perform data analysis directly on the instrument screen, saving valuable time. Further, onboard barcode readers can automatically scan sample IDs, reducing the risk of typing errors and facilitating sample traceability. Simple operation patterns can also increase tech confidence and boost productivity.

## Data Storage: What Do You Need to Do With Your Test Results?

Once you have a test result, you need to evaluate how you want to store it, so physicians and lab staff can access it when needed. Directly transferring the results from the osmometer to the LIS would avoid transcription errors and minimize paperwork. "Advanced Instruments osmometers store 1,000 results which can be printed, exported via USB or sent to the LIS, and they maintain an audit trail of 10,000 events. You cannot delete results." Audit trails are a critical feature to ensure data security and traceability: Every event is recorded and cannot be modified. Further, Advanced Instruments osmometers do not store patient information such as name, age or any type of demographic details aside from the sample ID, ensuring patient security.



**OsmoPRO® Multi-Sample Micro-Osmometer**

## Automation: Are You Considering Optimizing Your Workflow To Boost Productivity?

Manual, freezing-point osmometers require a trained member of laboratory staff sitting in front of them and analyzing one sample at a time. This process is very time consuming, hinders urgent analyses and is susceptible to human error. Fully automated instruments can help overcome these limitations and provide precise and accurate results with minimal staff involvement. Automated osmometers do the majority of sample handling and minimize technicians' exposure to potentially infectious samples as no pipetting or sample transfer is required. This automated approach results in increased safety in the lab, a simplified workflow and, ultimately, a drastic reduction of turnaround time. Automation also gives the lab "tech time" back, so lab technicians are free to engage in more challenging tasks. Moreover, predictable and consistent testing times and techniques eliminate variations occurring between different technicians.

While this equipment requires a larger initial investment compared to some alternatives, automated osmometers such as Advanced Instruments OsmoPRO® MAX can bring your efficiency to the next level, delivering accurate and precise results while maximizing walk-away time. "Customer data comparing single-sample osmometers with automated osmometers showed that switching to a fully automated osmometer significantly shortened turnaround times, reducing them from a median of 12 hours to a median of 2 hours," explains MacKenzie. "The automated OsmoPRO MAX also improved accuracy and prevented sample mix ups. This data shows the benefits—in terms of efficiency and productivity—of going from a manual single sample to an automated multi-sample instrument."

This increased productivity is key for bringing osmometry to the next level, reaching a perfect combination of analytical performance, ease of use and walk-away operation.



**OsmoPRO® MAX  
Automated  
Osmometer**



1. <https://www.ncbi.nlm.nih.gov/books/NBK567764/>

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