# *pergo* Integrated Argon Humidifiers for ICP and ICPMS

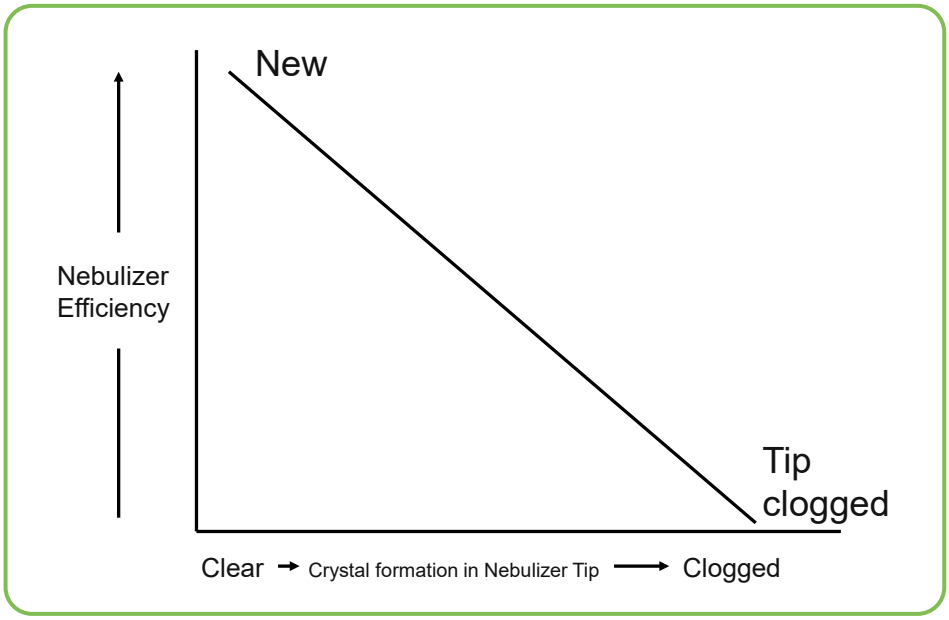

PerkinElmer®
*For the Better*

# Nebulizer Efficiency

## Microcrystals in Nebulizer Tip Decrease Efficiency

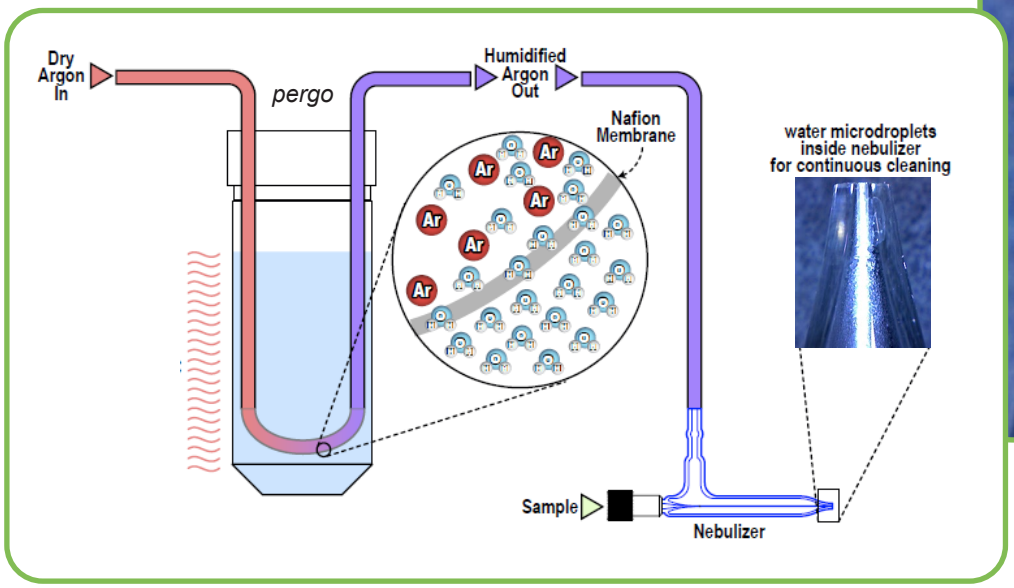
The *pergo* improves performance of all concentric nebulizers. It maintains nebulizer efficiency – which decreases long before a clogged tip is detected – and improves sensitivity and stability by preventing salt crystals from forming in the nebulizer tip. Over time, these virtually invisible salt crystals, if not prevented with *pergo*, cause premature failure of the nebulizer and shorten its analytical lifetime.

**Nebulizer Efficiency**




## How *pergo* Works

A water vapor permeable membrane humidifies the ICP or ICPMS nebulizer gas stream. By increasing humidity in the argon nebulizer, the *pergo* prevents salt deposits in the nebulizer, improving short- and long-term signal stability.




Water microdroplets continuously clean the inside of the nebulizer and prevent salt deposits.

Ar nebulizer gas is humidified using a tube-shaped membrane placed in a PFA water reservoir at atmospheric pressure. The water vapor condenses inside the nebulizer tip, preventing salt buildup.

# *pergo* 2000 and 2000 AMS

## *pergo* is Easily Integrated into the NexION

Installing and maintaining *pergo* 2000 is easy. The reservoir is 100% high-purity PFA with a friction-fit cap that can be removed easily to maintain the DI water level. There is no fussy reservoir liner to maintain.


*pergo* 2000
argon humidifier

### Benefits:

- Dissolves salt crystals in nebulizer tip
- Improves short- and long-term stability
- Improves detection limits
- Speeds up washout
- Reduces long-term drift
- Extends the length of productive analytical runs

### Features:

- Atmospheric pressure water reservoir is shatter-proof, safe and easy-to-use
- Solid PFA reservoir with friction-fit cap for easy access
- Allows use of high-sensitivity nebulizers for high-matrix samples
- Supports both MEINHARD® and PFA MicroFlow nebulizers
- *pergo* 2000 AMS model also enhances AMS performance with a second port that additionally humidifies the AMS argon gas stream

NexION 1000/2000 with the integrated *pergo* 2000


*pergo* 2000 AMS - Dual channels humidify both nebulizer and AMS matrix gas

*pergo* 2000 systems mount onto existing NexION 1000/2000 pumps as well as *FAST* and prep*FAST* DXi modules

# *pergo* 500 for Avio ICP

## *pergo* 500 Humidifier

The *pergo* 500 fits efficiently in the Avio sample compartment area. The reservoir is 100% high-purity PFA with a friction-fit cap that can easily be removed to maintain the DI water level. There is no fussy reservoir liner to maintain. It can also be used on all models of Optima ICP.

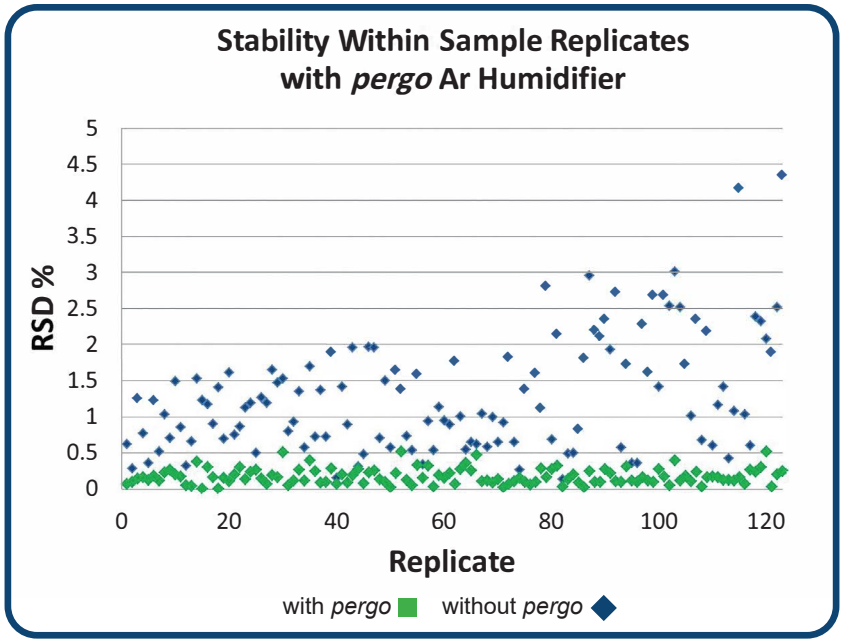

*pergo* 500


Avio 500 ICP with *pergo* 500

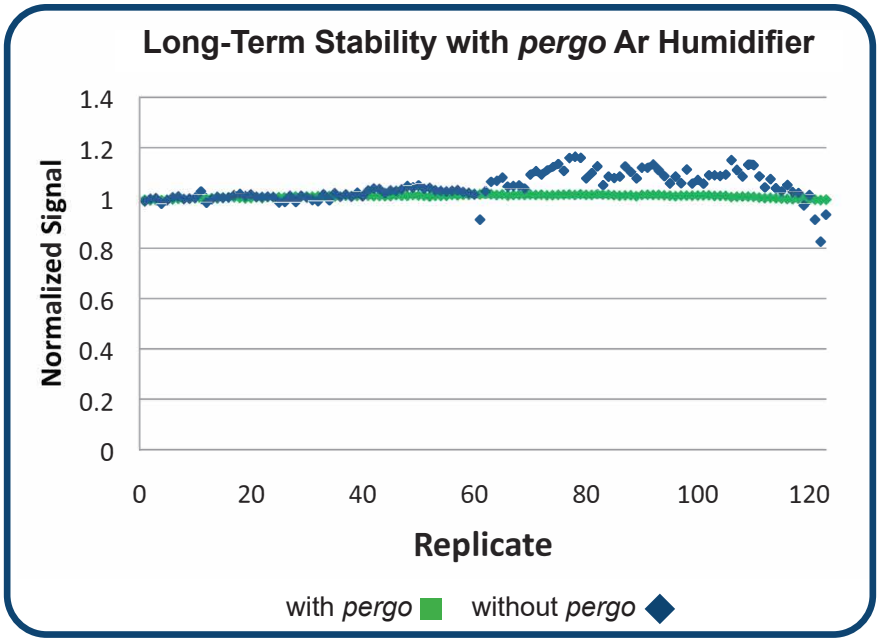

Avio 200 ICP with *pergo* 500

## *pergo* 500 – Improves Short- and Long-term Stability

*pergo* 500 improves ICP performance by maintaining peak nebulizer efficiency for all sample matrices. The plots below highlight the benefits of *pergo* when running 5% NaCl samples.




RSDs for 5% NaCl samples improve significantly when the *pergo* is utilized




Improved long-term stability is achieved when utilizing the *pergo*, reducing signal drift and extending the length of analytical runs

# *pergo* Improves ICPMS Performance

## *pergo* 2000 – Enhances Productivity through Improved Stability

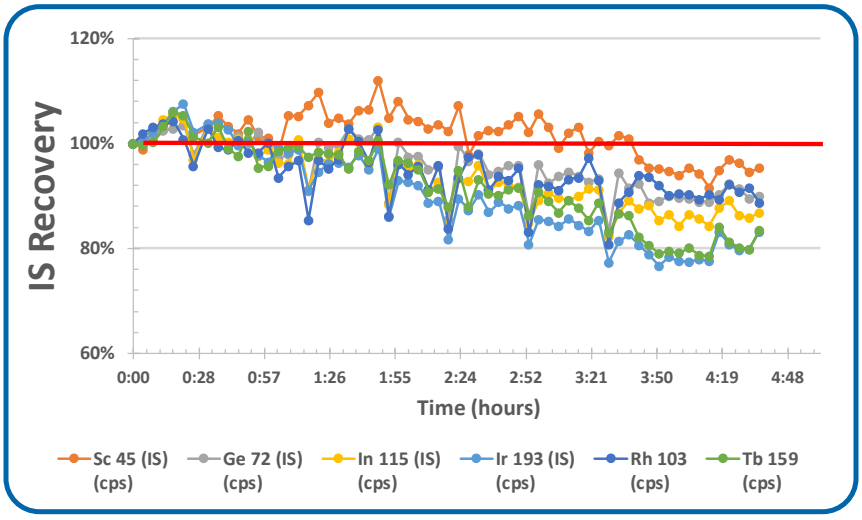
### Environmental Application: NexION 2000 Drinking Water with US EPA Method 200.8

Natural water samples have highly variable concentrations of cations such as Ca, Mg, Na, and K. Salts of these ions precipitate and form microcrystals at the tip of the nebulizer, decreasing efficiency over time. This causes signal drift, that is evident in reduced internal standard recoveries. *pergo* 2000 enhances productivity and improves data quality by preventing this long-term drift, allowing longer analytical runs without maintenance or recalibration.

### Internal Standard Recoveries Over 4 Hours Running USGS Standard Reference Waters

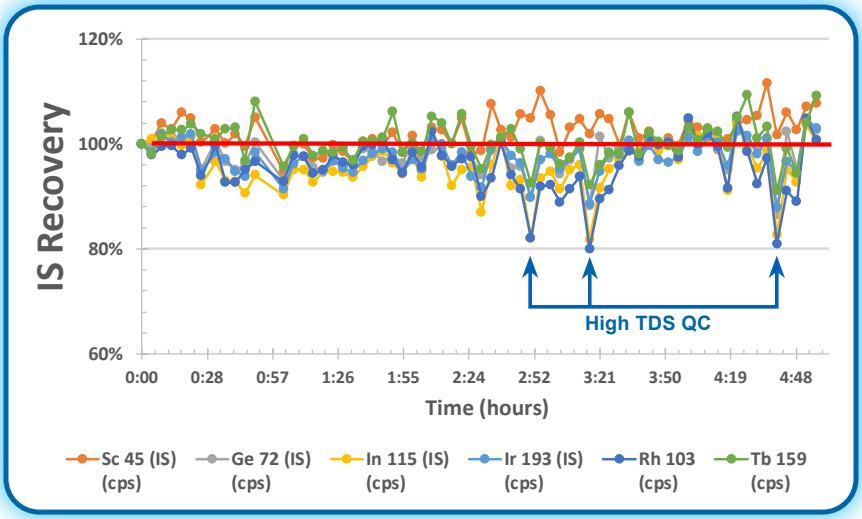
**NexION 2000 and MEINHARD® Nebulizer without *pergo***

Internal standard response drifts as microcrystals form in nebulizer tip




**NexION 2000 and MEINHARD® Nebulizer with *pergo***

Internal standard response remains stable




With *pergo*, drift is eliminated and internal standard elements recover immediately after high TDS QC standard.

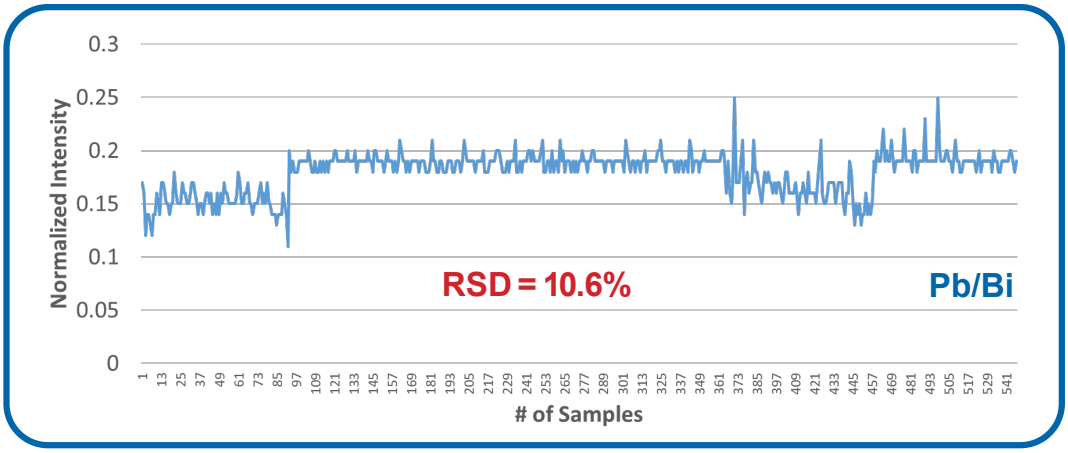
Data courtesy of Ruth Wolf, PhD, PerkinElmer Field Application Scientist

# *pergo* 2000 AMS – Enhances AMS Performance

## Clinical Application: NexION 2000 Blood Pb Analysis

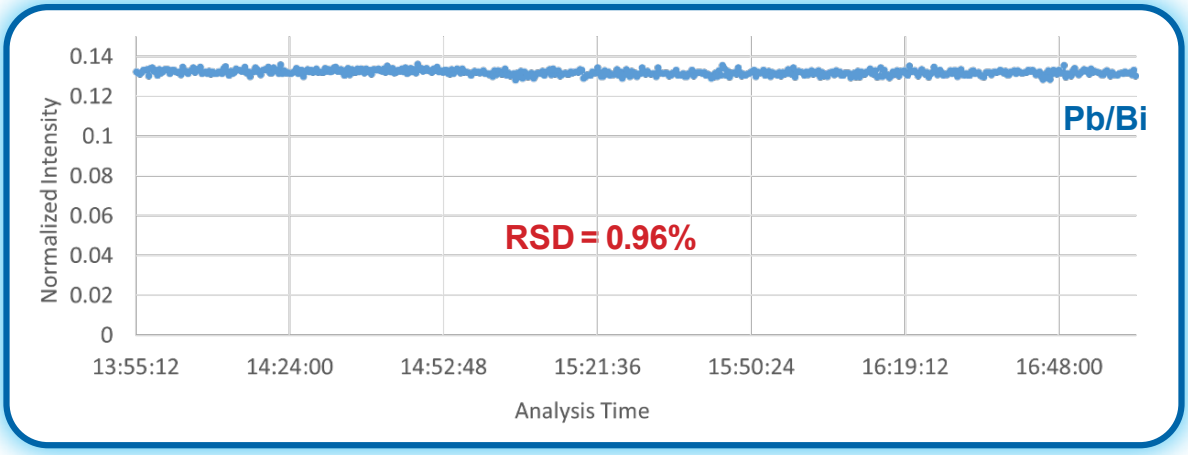
The *pergo* 2000 AMS humidifies both the nebulizer and AMS argon streams, maintaining nebulizer efficiency and enhancing AMS performance. The plots below compare stability data for an Ultra-high Throughput (UHT) system analyzing blood Pb. The plots show the ratio of the analyte Pb to Internal Standard Bi over the rapid analysis of 550 samples (~ 20 seconds per sample).

### Analysis of 550 Blood Samples without AMS and without *pergo* 2000 AMS




**Ratio of Pb Signal and Internal Standard**

### Analysis of 550 Blood Samples with AMS and *pergo* 2000 AMS




| Description | Part Number |
|---|---|
| *pergo* 500 humidifier to all Avio and Optima models | N0810951 |
| *pergo* 2000 integrated humidifier for NexION 1000/2000/5000 nebulizer gas | N8150499 |
| *pergo* 2000 integrated humidifier for NexION 1000/2000/5000 nebulizer and AMS gas | N8150498 |
| *pergo* 300 integrated humidifier for NexION 300/350 nebulizer gas | N8140750 |
| *pergo* 300 AMS integrated humidifier for NexION 300/350 nebulizer and AMS gas | N8140751 |