



**GLASS EXPANSION**

Quality By Design

# The “**Top 5**” Tips & Tricks to Maximize Performance & Minimize Downtime



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# #5 Monitor Nebulizer Backpressure and Sample Uptake Rate

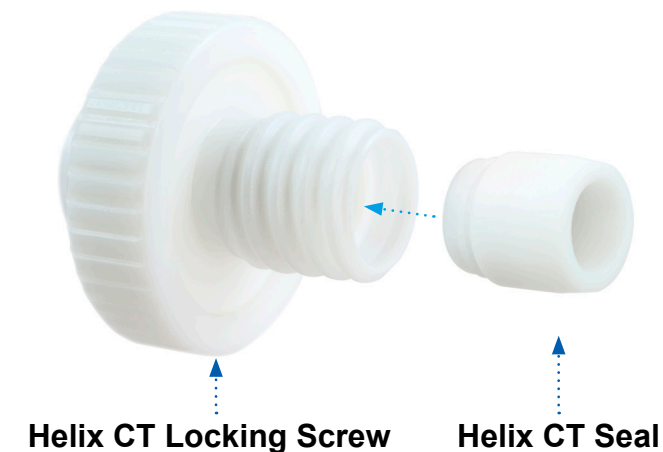


- Record or take note of your nebulizer backpressure after the instrument has warmed up, and use this as a benchmark as the instrument is running. An abnormally high or low backpressure indicates a problem that needs to be addressed.
- Low backpressure, typically coupled with a loss in sensitivity, can indicate a gas leak. Check the connection at the instrument and nebulizer.
  - **“Direct Connect”** fittings are the most secure and easiest to replace.
- A high backpressure typically indicates a blocked or clogged nebulizer.
  - Nebulizer should be cleaned using appropriate procedures.
  - **“Eluo”** device is recommended.
- Manually monitor sample uptake rate to ensure the correct or expected value. A change in uptake rate can indicate a nebulizer or tubing blockage, worn pump tubing, or incorrect pump tension.
  - Replace pump tubing routinely.
  - **“EzyGlide”** Cloth lubricates pump rollers to reduce wear and extend life.
  - **“TruFlo”** Sample Monitor actively and precisely monitors uptake rate, as well as enabling you to set optimal pump tension.
  - Use **“Sample Uptake Calculator”** on GE website to calculate expected flow rate.



## #4 Regularly Inspect Gaskets, O-Rings, Seals, and Ferrules

- Worn or damaged gaskets, O-rings, seals, and ferrules can often be a “hidden” problem, as they are generally not routinely inspected.
- If a graphite gasket is used with your sampler cone, it should be replaced **every time** the cone is removed and re-installed. The gasket is designed to deform to make up any irregularities in the mating surface of the cone, so a new gasket should always be used before installing or re-installing a sampler cone.
- Some torch designs contain multiple O-rings, which are often a point of failure, resulting in gas leaks and either plasma instability or an inability to ignite the plasma.
- Demountable torch designs often use a ferrule to seat the injector. This can become worn or deformed over time, as the injector is replaced or removed for cleaning and reinstalled and exposure to the harsh conditions of the plasma stand.
- Some spray chambers still use an O-ring seal for the nebulizer, which leads to multiple problems, including prolonged washout, sample carryover, inefficient sealing, and a loss of sensitivity.
  - **“Helix CT”** design eliminates these issues.



# #3 Don't Neglect your RF Coil

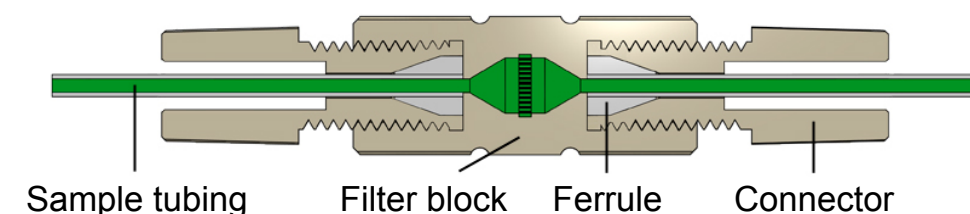
- The RF Coil is commonly ignored, as it is often not viewed as part of the sample introduction system.
- Damaged or corroded RF coils result in decreased plasma efficiency, requiring a greater strain to be placed on the RF generator.
- Misaligned or misshaped RF coils result in hotspots on the torch, leading to premature melting.



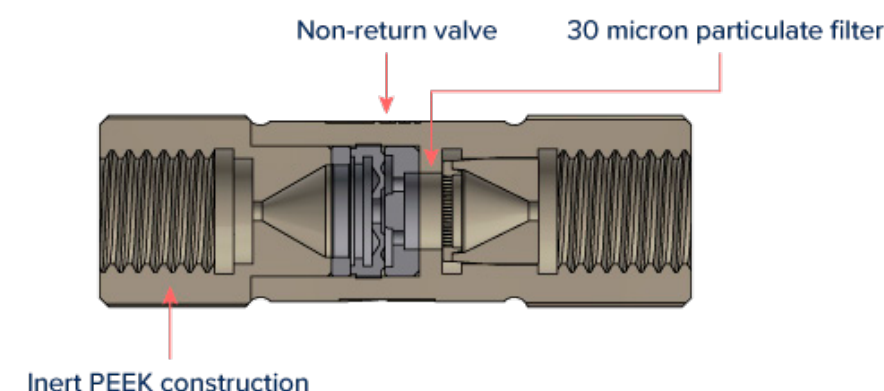
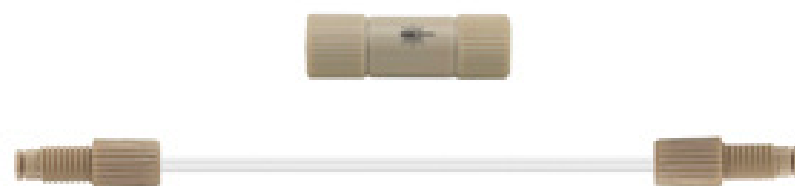
Damaged RF Coil

## #2 Safeguard your ICP: Prevent Nebulizer Blockages and Failed Analyses

- Glass Expansion offers several low-cost accessories to help prevent problems before they happen.
- The **Guardian In-Line Sample Filter** installs directly on the sample uptake or probe tubing. It contains a 120 µm PEEK filter that is designed to trap any large particulates that are taken up into the sample stream before they have a chance to reach and either block or damage the nebulizer. The filter is reusable and can be backflushed with the **Eluo** and appropriate adapter.



- The **Guardian In-Line Non-Return Gas Filter** prevents acidified sample or rinse solution syphoning into the instrument gas box. It also contains a 30 µm PolyComb filter to protect the nebulizer from particulates in the instrument gas supply.





## #2 Safeguard your ICP: Prevent Nebulizer Blockages and Failed Analyses

- The **Guardian Autosampler Probe** is a new product from Glass Expansion which combines drip-resistance with a built-in filter tip. The robust tip design eliminates crushed and damaged tips due to misalignment, drip-resistance prevents cross contamination of samples, especially with oils, and the built-in particle filter holds back particulates from blocking the sample line. It is a completely inert design, with all ceramic, PEEK and PTFE construction. It is available for CETAC, Agilent, PerkinElmer, Shimadzu, Thermo Scientific, and Aim Lab autosamplers.



# #1 Optimize your Sample Introduction System



- This may seem obvious, but the default or standard configuration that your instrument ships with is often not the best for your application.
- **“Optimize”** can mean many things, so it is important to determine the needs of your system, such as:
  - Maximum sensitivity
  - Improved precision
  - Robustness for “high matrix” samples
  - Minimal carryover
  - Improved washout for high throughput
  - Considerations for low sample volume (e.g., low-flow neb, low-volume spray chamber, etc.)
  - Compatibility with certain acids or solvents
  - The list goes on...
- The **“optimal”** configuration is unique to each lab, and we’re here to help!
  - Visit us at ICP Alley at Pittcon to find yours!



# Thank You

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