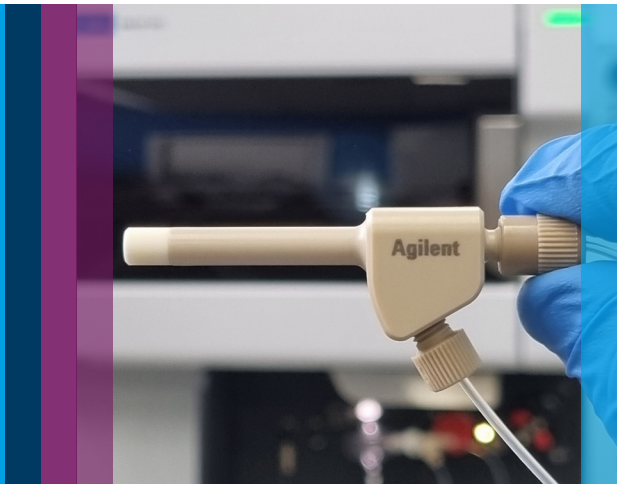
Improve Efficiency and Reduce Downtime from Nebulizer Blockage

Agilent V-groove Nebulizer for ICP-OES and MP-AES



Elevate Your Lab Efficiency with Unmatched Robustness

Boost your productivity with the Agilent inert V-groove nebulizer and say farewell to downtime caused by nebulizer blockages! Designed to tackle the toughest samples, this nebulizer is virtually unblockable thanks to its parallel-path design and V-groove nebulization.

Engineered with a precision-made ceramic V-groove tip and a 1 mm ID sample capillary, it ensures stable long-term performance with the most challenging sample matrices. The PEEK body makes it inert so it can handle hydrofluoric (HF) acid digests and organic solvents, including used oils that may contain large particulates.

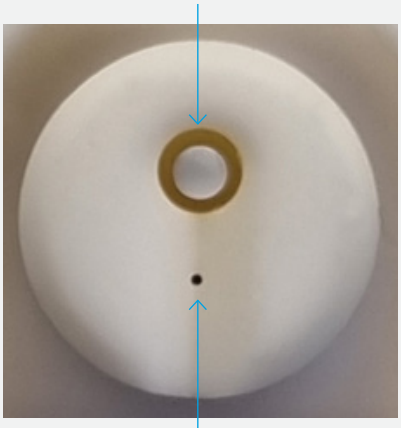
Fine particles can easily block conventional nebulizers

Reduce Blockages with your Most Challenging Matrices

Specifically designed for labs that handle the most challenging sample matrices with large particulates, high acid concentrations and high levels of total dissolved solids, the Agilent inert V-groove nebulizer reduces the need for pre-filtering, sample re-analysis, and frequent maintenance due to blockages. Ideal for samples with high Total Dissolved Solids (TDS) or large suspended particulates, this nebulizer offers exceptional robustness and resistance to blockage, ensuring uninterrupted performance.

The inert V-groove nebulizer can replace conventional glass concentric and other inert nebulizers that you may be using for these challenging matrices, providing improved robustness and trouble-free analysis with excellent long-term stability. Choose the best for your lab and experience the difference!

Large sample output allows unrestrictive flow down the V-groove tip



Precision gas orifice generates a consistent aerosol

Agilent

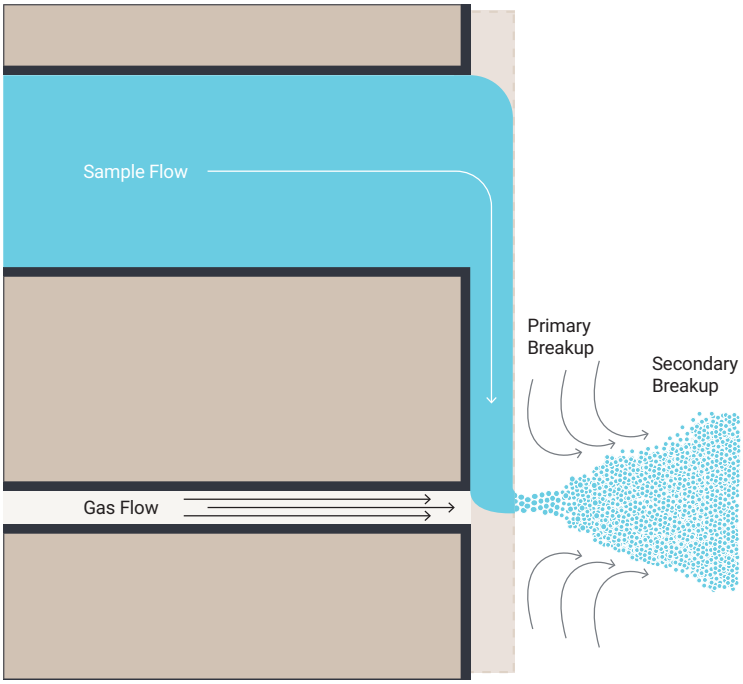
Trusted Answers

Why V-groove Nebulization?

Conventional nebulizers rely on the venturi effect to produce an aerosol as the nebulizer gas flow is forced through the tip past the inner sample capillary. The narrow sample capillary is prone to blockages—especially with samples containing large particulates or high TDS levels.

In contrast, V-groove nebulization introduces the sample through a separate orifice, enabling it to flow down the V-shaped groove in the tip. The nebulizer gas is introduced below the liquid outlet at a right angle to the solution flow and an aerosol plume is created as the liquid sample flows into the nebulizer gas outlet.

The nebulizer gas flow promotes highly turbulent mixing, creating fine droplets. With a 1 mm id sample capillary and an independent gas channel, blockage with challenging matrices is virtually eliminated.



Unmatched robustness

After 8 hours of continuous aspiration of a challenging matrix with high TDS levels (un-filtered digested black mass from Li-ion battery recycling in 30% aqua regia), a build-up of undigested particulates can be observed in the spray chamber body. The tip of the V-groove nebulizer (highlighted) remains free of blockage, illustrating its capability to handle challenging matrices with minimal blockage.

Advantages

- **Virtually Unblockable** – Ideal for samples with high TDS (30%) and/or large suspended particulates (up to 350 µm).
- **Enhanced Productivity** – Reduces prefiltering, re-runs, and frequent maintenance.
- **Robust** – Virtually no risk of blockage or damage, even with large particulates or accidental drops.
- **Inert** – PEEK body and ceramic-tip ensures compatibility with virtually any sample, including organic solvents and geochemical digests with HF or other strong acid mixtures.
- **Easy to Use** – Simply replace your existing inert or high TDS nebulizer with the V-groove. No other method changes are required.
- **Simple Maintenance** – Eliminate unplanned blockages by rinsing after analysis and clean regularly.

Elevate your lab's performance with the Agilent inert V-groove nebulizer. Experience the confidence of trouble-free analysis and long-term stability.

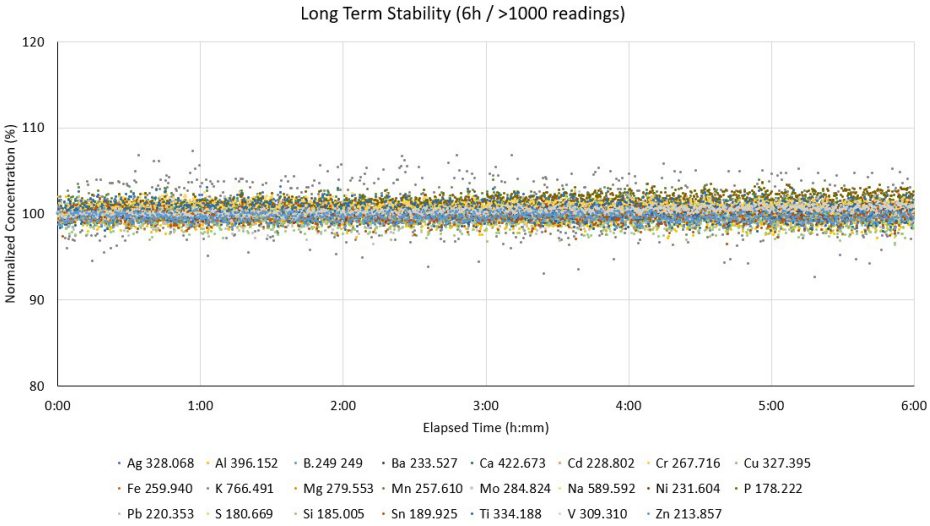


Figure 1. Long-term stability study showing normalized concentration (relative to the first reading) for a used oil sample, spiked with different elemental concentrations, over a period of 6 hours (> 1000 samples). Excellent long-term stability was achieved, with replicate precision better than 5% RSD in most cases.

10 benefits of the inert Agilent V-groove nebulizer

1. **Eliminates downtime** from frequent nebulizer blockage
2. **Inert:** use with virtually any solution
3. **Lower running costs:** Reduce the need to clean or discard blocked nebulizers
4. **Improve productivity:** Reduces rework caused by blockages
5. **Improve Efficiency:** Reduce filtering and maintenance
6. **Higher throughput:** Excellent long-term stability means longer runs
7. **Less downtime:** Minimize blockage with high TDS samples
8. **Suitable for any ICP-OES and MP-AES systems**
9. **Easy set-up:** Replaces a conventional glass concentric or inert nebulizers without adaptors or method changes
10. **Reduced administration costs:** Agilent can satisfy all your supply needs

Agilent Inert V-groove Nebulizer Specifications

Configuration	V-groove tip via parallel path design
Material	– Tip: Precision-made ceramic from high-purity alumina – Body: PEEK with a 1.0 mm id PEEK sample capillary
Body	– 6 mm od; compatible with most spray chambers
Sample capillary	– PFA 1.6 mm od, 1.0 mm id x 500 mm L – Connects to nebulizer using a PEEK threaded connector – Capillary/connector assembly is removable and replaceable
Sample connection	– PEEK connection to peristaltic pump tubing – Suits pump tubing with id 0.020 to 0.030 in (0.5 -0.75 mm)
AVS connector	– Direct connection using the optional V-groove nebulizer to AVS switching valve connection kit (ordered separately p/n 5005-0445)
Nebulizer gas connector	– Quick-release
Solution uptake range	– 0.04-2.0 mL min^{-1} – Sample solutions must be pumped (not self-aspirating)
Nebulizer gas flow range	– 0.4-1.2 L min^{-1}
Compatibility	– Fits standard glass cyclonic, inert and Scott-type spray chambers – Direct replacement for standard glass concentric nebulizers and inert nebulizers with a 6 mm od tip – Recommended for Agilent ICP-OES and MP-AES instruments including AVS switching valves
Typical applications	– High TDS (up to 30%) samples – Samples with large particle sizes (up to 350 µm diameter) – Acidic solutions, including aqua regia, hydrofluoric acid (HF), 4-acid digests and fusions – Lithium-ion Battery analysis, including brines and black mass – Organic solvents, including wear metals

Ordering information

Description	Part Number
V-groove, inert high-TDS, nebulizer for Agilent ICP-OES/MP-AES systems, 1/pk Includes: Sample inlet line, Gas inlet line, Adaptor for V-groove gas connection to MP-AES or 700-series/Vista ICP-OES, and Nebulizer Cleaning wire for gas orifice, 0.3 m	G8020-69001
Replacement Parts	
Sample inlet line, V-groove nebulizer to sample tubing (1/16") 1/pk	5005-0447
Gas inlet line, V-groove nebulizer to 5000-series ICP-OES carrier outlet, 1/pk	5005-0446
Adaptor for V-groove gas connection to MP-AES or 700-series/Vista ICP-OES, 1/pk	5005-0448
Cleaning wire, for gas orifice, 0.3 m, 3/pk	5005-0451
Nebulizer connection kit, V-groove nebulizer to AVS switching valve, 1/pk (Optional)	5005-0445

DE-001510

Published in the USA, October 1, 2024
5994-7839EN

Agilent
Trusted Answers