

Simple Steps for Clearing a Blocked ICP-OES Nebulizer

Blocked Nebulizer



Remove blockages to ICP-OES productivity

A blocked nebulizer can restrict aerosol formation, decreasing sensitivity and degrading accuracy and precision. Reduced nebulizer flow is a particular concern, because it contributes to poor performance.

With nebulizer blockages, prevention is the best cure. Be sure to filter all samples and other solutions that are aspirated to remove large particulates. In addition, keep your samples, standards, rinse solutions, and other solutions covered whenever possible, to reduce the ingress of dust from the lab environment. If you use a wide-mouth bottle for rinsing, boring a small hole in the cap will minimize the risk of dust entering the solution.

Regular rinsing between samples and at the end of the run, combined with regular cleaning of the nebulizer is also important. However, improper cleaning techniques can permanently damage the nebulizer. Follow the steps outlined in this technical overview to routinely clean your nebulizer, and to remove blockages if or when they occur.

Routine cleaning—concentric nebulizers



Backflush with a suitable cleanser, such as methanol or a 2.5% detergent solution. We recommend using a dedicated [nebulizer cleaning tool](#) (p/n G3266-80020).

If you don't have a nebulizer cleaning tool, you can use one of these alternate techniques to backflush the nebulizer:

1. Reverse-pump the cleaning solution through the nebulizer tip using the peristaltic pump tubing connected to the sample inlet.
2. Apply suction from the sample inlet using a vacuum aspirator.
3. Connect a syringe filled with the cleaning solution to the nebulizer tip using a piece of soft plastic tubing (such as a small length of peristaltic pump tubing). Use the syringe to carefully dispense the cleaning solution through the nebulizer tip. Do not let the nebulizer tip touch the tip of the syringe. Do not use excessive force when applying pressure to the syringe plunger.

Routine cleaning—OneNeb nebulizer



The Agilent nebulizer cleaning tool cannot be used for backflushing the Agilent OneNeb nebulizer as it differs in construction to concentric nebulizers.

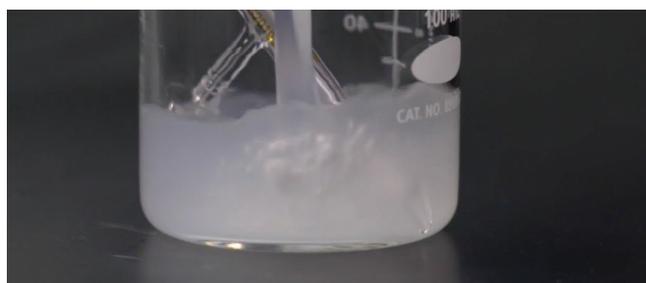
For good practice and maintenance guidelines for cleaning the Agilent OneNeb nebulizer, [click here](#).

What if deposits remain?



To remove stubborn deposits:

1. Soak the nebulizer overnight in concentrated nitric acid. Use a pipette to ensure that there are no air bubbles trapped in the nebulizer capillary.
2. Rinse with de-ionized water.



To remove salt deposits:

1. Soak overnight in 25% detergent solution.
2. Rinse with de-ionized water.

Caution

- Never sonicate or use a wire to clean a glass concentric or OneNeb nebulizer.
- Do not use hydrofluoric acid with glass or quartz sample introduction components.
- Always use care when handling or installing. Excessive force can break the nebulizer.

ICP-OES Troubleshooting and Maintenance

Videos: Nebulizers

Learn more about nebulizer maintenance - and how to get the most from your peristaltic pump tubing. [Watch now](#).

Tips to minimize blockages and achieve the longest operational use

- Always cover the sample container.
- Filter or centrifuge the solution (if necessary) to remove larger particulates that may cause blockage.
- Routine flushing with clean rinse solution between samples, and after a run will help prevent deposits forming in the nebulizer.
- Nebulizers with a broken or chipped tip should be replaced.
- Mist or aerosol formation in the glass cyclonic spray chamber usually indicates the nebulizer is performing satisfactorily. If the mist is not visible, or shows excessive pulsation/random fluctuations, this may indicate the nebulizer is partially or totally blocked.
- Nebulizer blockages may be cleared by pumping rinse solution through the nebulizer. If this does not clear the blockage, try backflushing the nebulizer.

Video resources for overcoming common ICP-OES challenges

Agilent OneNeb Series 2 Nebulizer

Learn how to achieve better sensitivity and precision, and improve tolerance to samples with high levels of total dissolved solids (TDS) by switching to the Agilent OneNeb Series 2 nebulizer. [Watch now](#)

ICP-OES Troubleshooting and Maintenance: Spray chambers

Learn how to clean and maintain spray chamber performance and learn more about different spray chamber types. [Watch now](#)

ICP-OES Troubleshooting and Maintenance: Torches

Learn how to clean and maintain your torch—and re-install/align after cleaning. You'll also learn more about different torch types. [Watch now](#)

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