



ONENEB2 MAINTENANCE GUIDELINES

1. Good practice guidelines

Use this startup and shutdown procedure to minimize a potential nebulizer blockage:

- 1.1 Turn on the nebulizer gas flow.
- 1.2 Start the peristaltic pump to introduce the liquid sample.
- 1.3 Use the nebulizer normally, rinsing between samples.
- 1.4 At the end of analysis, always rinse the nebulizer before extinguishing the plasma. Nebulize a suitable rinse solution for a few minutes and empty the sample capillary.
- 1.5 Extinguish the plasma.
- 1.6 Turn off the nebulizer gas flow.



2. Preventing blockage in the nebulizer gas inlet

Solid particles in the nebulizer gas inlet can be potential sources of nebulizer blockage. Removal of dust, fibers and other particles close to the nebulizer is essential to minimize a potential nebulizer blockage. Follow these guidelines to minimize it:

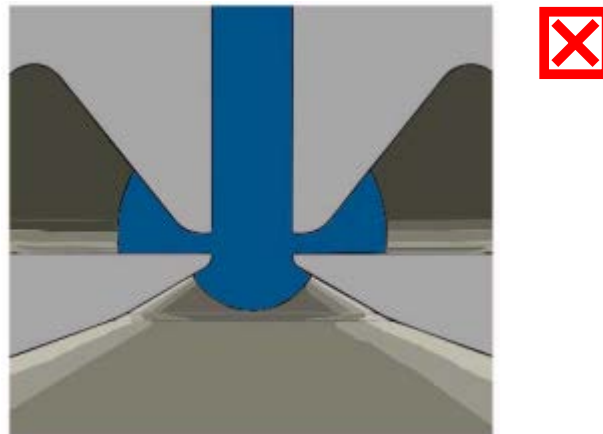
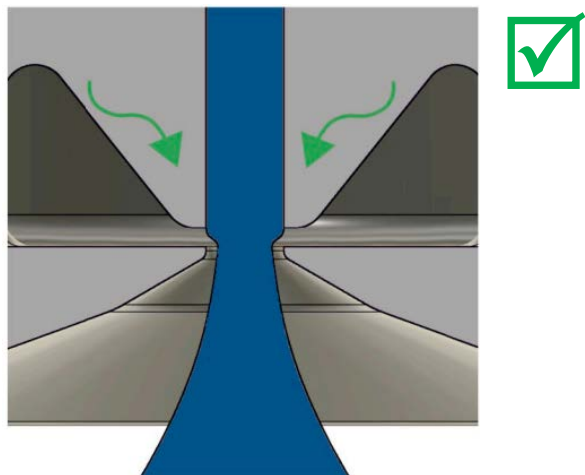
- 2.1 Keep the working place clean during nebulizer installation.
- 2.2 Purge the gas lines to remove any foreign material before connecting the nebulizer gas supply. This can prevent foreign material from nebulizer installation process (shavings, dust, etc.) can block the nebulizer.
- 2.3 Minimize removal and replacement of the quick-connector from the nebulizer gas inlet. Only change or remove the quick-connector for the nebulizer gas inlet when absolutely necessary. Fine plastic shavings or particles may be produced when removing or replacing this connector and they may block the nebulizer.

3. Preventing blockage in the nebulizer sample inlet

The internal diameter of the sample capillary is only 500 μm , and the orifice at the tip of the nebulizer has an internal diameter of 240 μm . Follow these tips to minimize the nebulizer blockage:

3.1 Filter or centrifuge samples as necessary prior to analysis (especially for particulates larger than 150 μm in diameter).

3.2 Keep your samples, standards, rinse solutions, and other solutions covered whenever possible, to reduce the ingress of dust. It is recommended boring a small hole in the cap to minimize the risk of dust entering the solution.



4. Prevent physical damage to the nebulizer

Regular rinsing between samples and at the end of the run, combined with regular cleaning of the nebulizer are also important. However, improper cleaning techniques can permanently damage the nebulizer:

4.1 Do not sonicate the nebulizer in an ultrasonic bath. The vibrations from the bath could damage the nebulizer internally.

4.2 Do not insert foreign objects like cleaning wire into the capillary tip (e.g. to remove blockages). Remove blockage by using the cleaning procedure described in the Section 5.

4.3 Handle the sample capillary with care. Never pull on the sample capillary tube. Excessive force applied to the sample capillary can permanently damage the nebulizer or affect its performance.

4.4 Avoid unnecessarily dropping or knocking the nebulizer.

5. Cleaning the OneNeb 2 nebulizer

To maintain optimum performance, always rinse the nebulizer after use and clean the nebulizer at least weekly. Clean the nebulizer by soaking in de-ionized water, dilute detergent solution, or solvent (depending on the application) for several minutes (normally 30 minutes). Rinse thoroughly and dry by passing a stream of filtered air, argon, or nitrogen through the tip of the OneNeb 2 nebulizer. This will help to displace the liquid inside the nebulizer through the gas inlet. Then re-install into the spray chamber. If blockage remains or if suitable performance is not restored after this cleaning process, use the following procedure:

5.1 Prepare a 1M NaOH solution in a 50-mL container.

5.2 Remove the quick connector for the nebulizer gas inlet.

5.3 Connect a 5-10 mL syringe to the nebulizer gas inlet tube using a small length of tube as a connector.

5.4 Submerge the tip of the nebulizer in the NaOH solution to a depth of 2 cm, approximately. Use the syringe to draw some of the NaOH solution into the nebulizer. Do not fill the nebulizer completely. Ensure the liquid level is below the nebulizer gas inlet.

5.5 Push the plunger of the syringe to force the NaOH solution out of the nebulizer. Note that some of the NaOH solution enters the sample capillary. Repeat the fill/empty procedure at least a couple of times.

5.6 Fill the nebulizer with NaOH solution, disconnect the syringe and allow it to soak, preferably overnight.

5.7 After soaking, repeat the step 4.5 with de-ionized water instead of NaOH solution.

5.8 Disconnect the syringe. Dry the nebulizer by directing a stream of filtered air, argon or nitrogen through the tip. The flow of gas will displace the liquid inside the nebulizer through the gas inlet.

5.9 Reconnect the nebulizer to the instrument and aspirate a rinse solution through the nebulizer for 10-15 minutes.