

NEON Sample Container Preparation Version 1.0

I. Background

This protocol describes general procedures for preparing various types of sample containers used NEON Domains in collecting samples for reaeration analyses. Please see protocols for specific information on each type of data collection or procedure, etc. Strict adherence to this and specific protocols will be compensated by increased confidence in the data we produce.

II. Potential Hazards

a. Lab Safety

Exposure to laboratory hazards is likely. All personnel must have up-to-date laboratory safety training and use common sense to evaluate risk to these potential hazards. Individuals are responsible for using appropriate protective attire such as lab coats, closed-toe shoes, gloves, safety goggles as appropriate for the vessels being prepared. Common hazards encountered in sample vessel preparation include acid bath, needles, slippery or wet floors.

III. HDPE (Nalgene) Bottles

a. Materials

1. HDPE bottles (see protocol for specific size)
2. 3.7% HCl bath (10% concentrated HCl)
3. Deionized water
4. Bottle brush

b. Method

1. Inspect bottles for any dirty residue or sediments. If detected, use a bottle brush to clean the bottle interior with deionized water.
2. Remove any taped labels. Thoroughly rinse bottles and caps in deionized water.
3. Place bottles and caps into 10% HCl acid bath, and allow acid to contact all inside and outside surfaces.
4. Thoroughly rinse bottles and caps with deionized water.
5. Place cap on bottle and place in bottle storage bin according to size.
6. Prior to collecting samples, obtain required number of bottles of appropriate size from the bottle storage bin. Inspect the bottles for damage such as holes or cracks, and discard the bottles if damage is found. It is often convenient to place the desired number of bottles in a storage bag or box in preparation for the field.

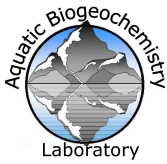
IV. Dissolved gas and Reaeration vials (Exetainers)

a. Materials

1. Exetainer vials (12 mL vials) Use either new vials or vials that have been acid washed as described for HDPE bottles above.
2. Exetainer septa and screw caps (double wadded septa).
3. Lock-n-lock containers filled with 1-2" of water
4. Vacuum tube with 1mL syringe fitting for needle OR 5-spot stainless steel manifold
5. 25 gauge needles
6. Sharps container
7. Two-stage vacuum pump and vacuum pump oil
8. Vacuum gauge Duniway #531.

b. Methods

1. Inspect vials for cracks. If detected, discard the vial into the broken glass bin. Inspect new septa and caps for cracks or other damage. If damage is found, discard into the garbage.
2. Screw on the cap so that the septum sits squarely on the vial. Do not over tighten or the septum will be damaged – finger tight is sufficient.
3. Inspect the oil level on the vacuum pump. If dirty, follow manufacturer's instructions to drain and replace oil.
4. If using single vacuum tube, check vacuum line and syringe canula for damage (leaks) and if necessary replace them. Place a new 25 gauge needle on the luer-lock fitting. Make sure the stopcock is closed before turning on the vacuum using the switch at the back.
5. If using the stainless steel manifold, inspect the lines and make sure all toggle valves are closed. Then turn on the pump using the switch at the back.
6. Inspect the pump oil level in the window – oil level comes up after turning on the pump. If low, turn off the pump (wait till cool) and add necessary amount of vacuum pump oil to bring oil level up. DO NOT OVER FILL.
7. Allow the pump to run for 5-10 minutes to evacuate the lines (if using vacuum gauge, wait until gauge reads ~200 mTorr).
8. Taking care not to stab yourself, gently pierce the septum with the needle, and open the evacuation valve. For 12 mL vials, it should be reached in ~5 minutes.
9. Once desired pressure is reached, close the toggle valves on the syringe adaptors (if using the manifold) or the stopcock (if using the single vacuum tube line), firmly grasp both the needle and the vial, and quickly pull the vial from the needle. Place evacuated vial septum-side down in storage container.
10. Repeat until desired number of vials is reached. It is always a good idea to prepare extras in case of failure in the field.



11. Turn off pump when finished evacuating vials. Discard used needle in sharps container.

SPECIAL CONSIDERATION FOR NEEDLES

1. Do not use another person's needle.
2. When finished with a needle, put the needle cap on and discard into a sharps container.
3. Needles can be used a few times before the tips become dull and/or the needle bends. Use judgement as to when to change needles. Often the septum will become more difficult to pierce.

SPECIAL INSTRUCTION FOR SHIPPING to NEON

1. Vials should be evacuated no more than 2 weeks in advance of shipping. Vials should be shipped upside-down in water (except for winter months when water can freeze, November – April). For reeration, 22 vials can fit in a single lock-n-lock. For dissolved gas, 1 vial can fit in a 50 mL centrifuge tube. Evacuated vials should be shipped in a cooler to NEON domain one week prior to their sample date. NEON schedule is posted to the lab wall and can be found in the shared Box folder.
2. Fill out vial shipment form in Box with shipment ID, date evacuated, date shipped.
3. Cleaned HDPE vials should be packaged in clean cardboard box and shipped to NEON domain to periodically replenish their stock of clean bottles.

V. References

- 1) American Public Health Association (APHA). 1998. Standard methods for the examination of water and wastewater 20th edition. APHA, Washington DC.
- 2) Glatzel, S. and R. Well. 2007. Evaluation of septum-capped vials for storage of gas samples during air transport. Environmental Monitoring and Assessment 136:307-311.