

FREQUENTLY ASKED QUESTIONS

1. Can the HydrAid® filter kill all bacteria?

Typically, the filter removes more than 90% of the bacteria if it is installed correctly. Usually the amount of bacteria that remains alive is not sufficient to make anyone ill. Nevertheless, disinfection with chlorine is recommended to remove any remaining bacteria.

2. Can the HydrAid® filter remove parasites?

Yes, typically 100% of parasites are removed if the filter is installed and used correctly. It is important to note that the majority of parasites are highly resistant to disinfection with chlorine; therefore the best way to remove parasites from the water is to filter it.

3. Can the HydrAid® filter remove viruses?

Yes, viruses are killed or deactivated through two mechanisms: sand filtering and post-filtering chlorination.

4. Can the HydrAid® filter remove earth or dirt in water?

Yes, the filter removes more than 95% of the dirt (solids or turbidity of water). Nevertheless, if the water is very dirty (more than 70-100 UOT units of turbidity) the filter will need to be cleaned frequently, making it less effective. If the water is very dirty, it should be left to rest until it clears. Also it is possible to filter it with a finely woven fabric (doubled several times) to remove the majority of the dirt before pouring the water into the filter.

5. Why must I add chlorine to the filtered water? Isn't the filter enough?

The filter removes the majority of the harmful bacteria in the water and all the parasites that have a high resistance to chlorine. The addition of chlorine to the filtered water will kill the bacteria that survive the filter and will prevent the recontamination of the water. Without the added chlorine, people with deficient immune systems -especially young children under 5 years of age, can become ill. Finally, if the crude water is highly contaminated, additional treatment after the filtration may be needed.

6. How do I add chlorine to the water?

The dirty water always must be filtered before adding chlorine. Put chlorine in the container where the clean water will be stored. It is recommended that sufficient chlorine be added to kill all the bacteria plus a little more to protect the water. It is difficult to calculate how much chlorine to add to the water because it depends on what is in the water and the concentration of the chlorine solution. Typically, it is recommended to add between 1 and 5 drops of chlorine to each liter of water and to leave it rest about 30 minutes before consuming. When a hardly detectable flavor and a scent are present, then sufficient chlorine has been added.

7. How do I find out if the turbidity of the water is less than 70 -100 UOT?

Fill a clear plastic bottle with 2 liters of water. Place the bottle on a paper with written words. Look down from above through the water in the bottle. If you can read the words, the water is less than 70 - 100 UOT and can be poured directly into the filter. If the water is too dirty see Question #3.

8. Can the HydrAid® filter remove salt from seawater and industrial pesticides, polluting agents or other chemicals?

The HydrAid® filter does not remove the salt from seawater. It does not eliminate contaminants such as industrial pesticides, polluting agents, or fluoride dissolved in the water. It is possible to make some modifications to the filter to help remove arsenic. The chemicals and other polluting agents can only be determined through testing.

9. What does a well-installed and well-maintained HydrAid® filter look like?

Location – Protected from the elements (dust and wind), birds, animals, mosquitoes and insects. It is preferable to install the filter inside.

Level – Placed on a flat surface – not inclined and without bumps.

Leaks – Free from leaks. Drops of water or wet areas beneath the filter indicate a leak

Cover – Clean on the outside and inside. The cover fits well but is not sealed.

Diffuser – Clean. The sand underneath the diffuser is level and flat. The diffuser does not touch the sand. Sand -the surface of the sand is 5 cm (2") below the water level.

10. What is the best way to use the filter?

- A. Use the filter daily -this will maintain the level of water at 5 cm over the sand (measure during the period of rest), and will keep the biological layer alive.
- B. Make sure that the water comes from the best source. Always use the same source if possible. If the water is very dirty, let the water rest for 24 hours, and then filter it by using a finely woven fabric (doubled several times).
- C. Remove the filter lid.
- D. Slowly pour water from a container through the diffuser plate into the filter, but do not allow the sediment to follow. Reposition the cover.
- E. Make sure that the container in which the water will be stored is clean. Add 1 to 5 drops of chlorine to each liter (or up to 1 teaspoon per gallon). For example, if the container holds 20 liters of water add at least 20 drops of chlorine.
- F. When the filtration is finished cover the filtered water container.
- G. Repeat the process at least once each day.
- H. Clean the outlet tube daily.
- I. Do not store food in the diffuser plate.
- J. Keep animals and children away from the outlet tube and the filtered water.

11. Which water should I use?

The HydrAid® filter will treat any water except salt water or water contaminated with chemicals. In order to obtain the best results, the water should not be very dirty. Always use the cleanest water source possible and try to always use the same source, if possible.

12. Which are the most common errors made by new users of the HydrAid® filter?

- A. Some new users want to add a tap to the Outlet Tube. That keeps the water level too high and prevents oxygen from reaching the biological layer.
- B. Some new users perform the biological layer maintenance procedure too frequently – doing so reduces the effectiveness of the water treatment.

- C. Some new users add chlorine to the water before filtering it instead of adding it to the container that receives the filtered water. The addition of chlorine directly to the filter will kill the biological layer and will reduce the effectiveness of the filter.
- D. Some new users do not let the dirt in the water settle before pouring the water into the filter.
- E. Some new users do not use the best possible water source because it is not the source easiest to reach.
- F. Some new users place the filter outside instead of inside. This increases the possibility of re-contamination of the filtered water.
- G. Some new users keep food in the filter because it is cooler there.
- H. Some new users do not use the filtered water to bathe, to wash their clothes, to cook, and to clean their countertops and utensils. They only use it to drink.
- I. Some new users use a large spoon or jar to remove water from the storage container. This will cause re-contamination. The water must be poured directly from the storage container.

13. How can the biological layer be seen?

The biological layer is not visible. At most a little discoloration may be noted in the sand.

14. Can something be dissolved from the filter and contaminate the water (the plastic, sand, or the biological layer)?

No. The plastic, sand, and biological layer cannot contaminate the water. Nevertheless, if the sand originates from a river, stream, or lake and is not treated properly before being installed, it could be contaminated with bacteria and must be cleaned (wash and dried under the sun or heated) to prevent a pollution hazard. Additionally, the outlet tube, standpipe and gravel layers need to be disinfected at the time the filter is installed.

15. How is the filtered water stored?

The water must be stored in a clean and covered/closed container from which the water can be removed by pouring. The water must be disinfected with chlorine to prevent re-contamination while it is being stored. Water should not be stored for more than a day or two at a time.

16. What should be done if the water is flowing very slowly?

Refer to Filter Maintenance Instructions (Section 7) and Trouble Shooting (Section 10) of this Handbook.

17. How often do I need to replace the sand?

The sand does not need to be replaced. It is cleaned with the “stir and throw” maintenance technique described in question #15.

18. How much water should remain over the sand?

During the rest period (the period in which the water is not flowing through the filter), there must be 5 cm of water on the sand. This allows for oxygen in the air to permeate the biological layer. If there is less than 5 cm, add a little water to compensate for evaporation. After adding the water, measure it again. If there is less than 5 cm, remove a little sand. If there is more than 5 cm a small amount of “approved” sand should be added. Use only “approved” sand – i.e. that which meets the HydrAid™ Filter Media Standard included in this Handbook.

19. How many times per day may I put water through the filter?

The filter may be used continuously.

20. What do I do if my filter is dry?

This can happen if the filter is not used during a long period or if it has a leak. The water level must be re-established filling the filter through the Outlet Tube using a funnel. Doing so will allow the water to rise from the bottom and will avoid creating air pockets in the sand. This process is similar to disinfecting the outlet tube and gravel layer at the time of installation. Be sure to use clean water. If clean water cannot be used, it should first be disinfected with chlorine.

21. What do I do if my filter begins to smell or if the water becomes discolored or poor tasting?

This is usually an indication that there has been improper filter maintenance. Refer to Filter Maintenance (Section 7) in this Handbook to correct the problem. To prevent such problems perform routine filter maintenance.

The most common cause of such conditions is improper technique in cleaning the biological layer. Some organizations, such as CAWST, have advocated a deep cleaning technique often referred to as

“harrowing”. The harrowing technique involves raking the fingers deeply into the top sand layer. The harrowing technique is not approved by HydrAid® or by Dr. David Manz the inventor of the biosand technology.

Deep cleaning causes three problems. The first is temporary destruction of the biological layer after every cleaning – restoration can take up to two weeks during which time filter effectiveness is compromised. The second is water odor, discoloration, and poor taste. The third is eventual clogging of the filter requiring removal/cleaning of filter media or its replacement.

The biological layer consists of sand particles that have developed a biofilm on their surface. The biofilm is organic in nature and requires oxygen to survive. Deep cleaning (harrowing) will cause those sand particles that constitute a portion of the biological layer to be driven (relocated) deep below the sand surface where there is little or no oxygen when the filter is not producing filtered water. When there is water flow through the surface of the sand, water containing oxygen will keep the biofilm coated particles “alive”. When the flow of water is stopped, oxygen may penetrate the upper ½ cm or so of sand but not much deeper. If there is no organic matter below the surface of the sand, anaerobic conditions do not cause problems. However, if the particles with the biofilm are moved below the sand surface, the biofilm dies and anaerobic decomposition of the biofilm occurs. The filtered water may then develop an odor, taste poorly, or even become discolored. This problem will be aggravated if captured organic matter is also swept deep below the sand surface during cleaning – something very difficult to avoid when deep cleaning techniques are used.