

Barrel Water Filtration Instructions

1. Find 1,2, or 3 clean plastic 55 gallon (208 liter) drums for your system. Metal will rust, unless you can find stainless steel. Galvanized barrels will also work.
2. Cut the tops off so they are open barrels.
3. Drill an appropriate hole for $\frac{3}{4}$ " (2.5 cm) white pvc water pipe fitting with an o ring and tightening nut on the inside of the barrel approx. 2-3 inches (7.5 cm) from the bottom of each barrel. Either glue on a short piece of pvc pipe, a 90 degree elbow, and a standpipe just higher than the top of the second barrel, or a faucet fitting if it is just a one barrel system, or the last barrel in the system.
4. Create a tight fitting false bottom either from the original lid or out of wood. Drill or perforate small holes approximately $\frac{1}{4}$ " (.6 cm) size throughout the entire false bottom. This is for water to drain through. Place it approx. 4 inches (10 cm) from the bottom. Prop it up if needed with blocks of wood or 10cm rocks.
5. Cover the false lid with clean white canvas. This is to keep the holes from plugging with sand.
6. Place the barrel on a pallet or other wood structure approximately 6-8 inches (18cm) off the ground and make it level.
7. Add 4 inches (10cm) of clean washed approximately $\frac{1}{2}$ " (1 cm) - pebbles on top of the false bottom.
8. Add 4 inches (10cm) of clean sand on top of the pebbles.
9. Fill barrel on top of the sand with either crushed store purchased charcoal, or homemade charcoal, to within 12 inches (30cm) of the top of the barrel. The charcoal should not be ground to fine powder, but generally crushed into fairly small pieces. (See below for more details on charcoal)
10. Add another 4 in. (10 cm) of clean washed pebbles as in step 5.
11. In the top 8 inches of space, drape a piece of clean canvas as a strainer for large debris.
12. Create a rainwater gutter from a rooftop or other source of water for the intake delivering water to the top side of the draped canvas.
13. Add water.
14. If only a one barrel system can be created, and the water is not too contaminated, this will suffice for shorter periods of time, and will need to be cleaned more periodically depending on its demand. It is much better to create at least a two barrel system, and three is even better.
15. Empty and clean system annually. For a one barrel system, may need to clean bi-annually. Washed pebbles can be reused, but new sand and new charcoal is needed.
16. The second barrel and subsequent barrels need to be placed approximately at least 2-3 inches (5-8 cm) below the level of prior barrels. The top of the intake pipe running from the bottom of prior barrels needs to be lower than the top of the previous barrel in order for gravity to do its job on water flow.
17. On the second and third barrels, cut the tops off in order to fill with sand, gravel, charcoal, etc (like the first barrel), but reinstall the lids on top with a drilled hole to accommodate the intake pipe running from the previous barrel.
18. Testing equipment or a microscope should be used if possible to guarantee the removal of bacteria and parasites.

Further Description of Charcoal

There are more technical ways to manufacture charcoal and these methods can be googled if a purchase of pre-made charcoal is not found. Often a simpler way of obtaining charcoal is by the remains of campfires or cooking fires. After the fire is out, you will find charcoal as the remains of unburned wood (or as often called, coals). If the fire is still burning, these red hot coals can be raked out, cooled, and then crushed to produce your charcoal. It is important that the charcoal is clean and ash free. If needed the charcoal can be washed to discard any ash. The crevices and cracks in the charcoal is what traps bacteria and protozoa so any ash will impede this process.

