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Why water filters and purifiers?

Tjin

- Gear reviews and tests - Bivouac -



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Description :

About the use of water filters, and test of two brands.

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Every year many people die, due to waterborne diseases and many others get seriously ill by them. Most of them are from poor countries with poor drinking water infrastructure. As most visitors to this website are from richer countries with a good drinking water infrastructure, we sometimes take it for granted that water is clean. But when we are hiking or doing other outdoor activities, we won't always find a tap. We could carry all the water we use with us from safe sources, but 1 liter of water weights 1 kilo. During long trips that will add up and become a serious burden. Thus most of us will find a source of water in the form of rivers, ponds, etc. People have been drinking water from rivers and streams for millennia, but with the industrial revolution, expansion of agriculture and increased amounts of people in the outdoors, many of them have been contaminated with chemicals, harmful bacteria, Giardia, tapeworms, protozoan organism, etc. This means we are possibly exposed to the same contaminates that kill so many people in underdeveloped country's. That's why we should get rid or neutralize these contaminates before we drink it. We can make water biological safe to drink with the following methods:

- boiling
- chemical treatment
- filtering

Boiling will kill biological hazards, but it takes a lot of fuel and time. Also the end product will be HOT water, nice for tea or coffee, but not if you just want a cold drink, during a hot day.

Chemical treatment is actually poisoning your water so it will kill the organism in it, but won't be very harmful for a person, because of our much larger body mass. Overdosing can be harmful for healthy persons. These chemicals are not suitable for everybody. Pregnant females should NOT use iodine, as everyone else that have sensitivities to iodine. Lately Giardia has spread, this organism is more resistant to chemical treatment. Chemicals have become less effective in killing all waterborne organisms.

But neither boiling or chemical treatments will get out chemicals and other particles. To do that we need a filter. These days you can get water filters from most outdoor stores. There are 3 types for the outdoor market, gravity filters, squeeze bottle filters and pump filters. They come in various pore sizes and materials. 2 micron filters will filter out things like gairdia, but not bacteria or viruses. 0.2 micron filters will filter out bacteria, but not viruses. A purifier will remove bacteria and neutralize viruses, usually done with iodine resin (as far as I know, First Need is the only manufacture of a purifier which doesn't use chemicals). A carbon element in the filters will absorb chemicals from the water, reducing there presence in the water.

More information on purification can be found [here](#)

I'm going to describe the 2 pump water filters I own, the Katadyn mini and the First Need purifier. Note that I haven't used either on extended trips. I usually can find reliable taps and only use these filters when I can't find any. It is actually kind of hard not to find them on this side of the European continent. Regardless of the filter, you should always try to find the cleanest water source possible, to keep yourself and the filter in good shape. None of the filters will turn salt water to drinking water.

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First need on the left, Katadyn mini on the right

Katadyn Mini

The Katadyn is, as far as I know, the smallest and lightest non-single use pump filter. It has a ceramic filter that filters out everything down to 0.2 micron large. This means it will get out bacteria and any other larger particles, but not chemicals or viruses. Being one of the smallest pump filters available, it has a big handicap: it's size! It has a small pump and a small ceramic filter element. This means you have to pump a lot more, to get as much water out as other filters. The quickest filtering will get you 0.5 liter a minute, but that's with a clean filter element. It gets slower and much harder if it gets dirty. Also adding an after filter will slow it down even more. Also the small size of the element makes it clog easier than other filters. But it's light, compact and handy.

The pump of the Katadyn mini is easily removed, giving access to the o-rings. This way you can lubricate them from time to time, preventing cracks in them and thus leaks as well. A tube of lubrication is supplied with the filter. You can also clean the shaft with a cotton stick to remove any particles left on it.

The ceramic element can also be easily removed. This way it's easily accessible when you have to clean it. The shaft it goes in, is wide and shallow enough, to clean it with 2 fingers and some tissue paper. You will find some particles inside the shaft. Between the pump and the filter there is a plastic gauge used to check the thickness of the element. Every time you clean the element you will remove a thin layer of it. When the element has become thin enough to fit between the gauge, it's time for a new element. The older models had a small piece of abrasive material on the gauge to clean the element with, but has been replaced with a cleaning pad. The element has silver particles in it, this will prevent the growth of bacteria. So after use you only have to air dry it. You do not need to mess with pumping chlorine solutions through the filter after you get back home. Their lab tests demonstrate the filter element good for 7000 Liters.



Katadyn mini disassembled

The outlet of the element is shaped to allow you to slip your Camelbak or Platypus Hoser tube over it. This way you

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don't have to pump the filter and aim and hold a bottle the same time. I do miss the ability to screw the filter on a bottle directly. But that's partially solved with the carbon after filter (available separately). This filter uses the same fillings as the Katadyn Combi. And is attached to the outlet hose (comes with the filter) of the filter. It absorbs most(if not all) of the chemicals in the water. And the end of it is shaped in such a way, that it will fit several kind of bottle's and standard tubing. But they don't screw on them, so the connection is not very solid. This carbon after filter will fit all Katadyn filters, as well as most other water filters. But will reduce the output rate of the filter.

The inlet hose fits in to the bottom of the filter, the space for it is a bit small. You can not get the float in it as well. I have seen people carry their inlet hose separately because of this. That small piece will stick out. The float is loose, so you can adjust the depth of the inlet piece. But it is slight too loose and needs something to hold it at the right place. The end of the inlet tube has a metal gauze cover that can only stop very big particles. I recommend a coffee filter to be placed over the intake to act as a pre-filter to extend the life of the filter element.

The bag the filter comes with ripped open on mine. This bag is also just a simple flat stuff bag. I would rather have a bag, that has waterproof separated pockets for clean parts and one for dirty parts, and some padding to protect the filter.

Good points: It's light, compact, handy, last for ages and easily maintained.

Bad points: It's slow and clogs easily, no good ways to attachment a bottle unless you have the after filter. Inlet hose doesn't entirely fits in the storage space.

[manufacture website](#)

First Need purifier



The First Need purifier.

The First Need is unlike the Katadyn mini purifier, it removes viruses from the water also. This fact is mentioned on their website. My particular model dates from the early 1990's. It does says it's a purifier on mine, but the manual I got with mine said that you should not rely on it for virus removal. But with newer models you apparently can.

This filter is a combination of a filter with a 0.1 micron retention (but 0.4 absolute) and a built in carbon element, which will remove most(if not all) chemicals in the water. It pumps easily and fast, but it weight is more noticeable than my Katadyn Mini. This unit is made out of a separate pump and filter, joined with a plastic connection, with a

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securing pin to keep it closed.

The pump has a much larger capacity than the Katadyn Mini. It's also a double action pump, which pumps water, both when you push and pull on the pump lever. This means you can pump much more water through the filter in less time. This makes the water coming out of this purifier fast and in a continuous stream (the filter canister has a buffer effect that makes the little stop, when you are all the way up or down, not noticeable when pumping.) Which is nicer than the slow and on and off effect with others. The downside of a double action pump, is that is more complex. And this particular one is a closed pump design, so I can't open it to clean and lubricate the parts. Something that might come in handy is that the pump can be fully disconnected from the filter canister. So you can use it as a separate pump as well, in case you need too. The pump lever has been changed since mine was produced.



The pump separated from the canister.

The filter canister is just like the pump closed. So you can't open it to clean it. But you are less likely to damage the filter itself. The filter is joined with the pump with a plastic connection, secured with a pin and a hose which is fixed to the canister with a clamp. Newer models are different on this particular section. To unclog this filter you need to back wash it. This means you disconnect the canister and reconnect the tube from the pump in to the outlet of the canister, then remount the clamp. Then you pump clean water through it, but this time you pushing water from the opposite side. And push the collected particles out the other way. However the pump usually pumps dirty water, this means you have to flush the inlet hose and the pumps properly before doing this, to prevent cross contamination. A abundance of water is needed to do this safely. So the field maintainability is bad. But apparently you can still use a clogged canister as a gravity filter. If you have the deluxe model that's not a problem, since the storage bag of that model can be turned to a water bag with attachment to the filter. I have the normal version. But you can improvise by using a platypus (or other hydration kit) as a dirty water bag, hung above it with the tube attached to the inlet nipple of the canister, to do the same. Leave it for the night to flow through. The canister has an outlet nipple that will fit Camelbak or/and platypus hydration tubes. Newer versions will also fit on common bottles.

This filter has no silver in it, so you have to use a chlorine solution to sanitize it. It lasts for about 475 Liters, much less than the Katadyn mini.



First Need canister in (improvised) gravity set-up



First Need in back flush mode

There is a small bottle of blue testing liquid. You add this to some water and filter it. If you see some blue-ish color in the water, your canister is broken. Nice feature, I haven't seen one other filters with intergraded carbon filter. The chlorine solution I use to sanitize the filter will also come out of the filter, as water with no noticeable chlorine taste or smell in it. Which indicates that the carbon element is quite effective.

The inlet hose I got with my filter kinks easily if you are using it in limited space. Also the inlet is just a simple steel gauze thing. But the newer versions have "kink free" tubes and a pre-filter. Mine is of an earlier generation, so I just have to use coffee filters with mine.

The storage bag is just like the Katadyn mini, a stuff sack. Again I prefer waterproof separated sections for clean and dirty parts.

Good points: Fast, ability to use as a gravity filter.

Bad points: bad maintainability, bit bulkier, "just" 475Liter clean water from one (expensive) canister.

[manufacture website](#)

More reviews about waterfilters can be found [here](#).

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I only wrote about these 2 filters, because these are the only one I own I have used. I also have a Gate-keeper squeeze filter, but I have not used it. It's my emergency water filter, with little capacity. There are many others on the market. If you decide to buy one, make sure you choose one that fits your purpose and personal preferences.