

water filters

While America's drinking water supplies are tightly regulated and are among the healthiest in the world, health-threatening contaminants may occasionally enter drinking water from old pipes, wells or municipal water treatment disruptions. The filters below have been independently certified to remove major contaminants, so there are no worries about getting those requisite eight glasses of water a day. Models below are sorted by type.

Name	Type	Filtration Method	Consumer Reports Rating	Contaminants Removed	Annual Filter Cost	MSRP	Manufacturer Contact	Reader Rating
Shaklee Perfect Pitcher	Caraffe	Carbon	61	4 including chlorine, particulates, taste and odor	\$90	\$17	www.shaklee.com , 925-924-2000	Avg. Rating Reader Comments Rate/Review This Product
Pur 2 Stage 7 Cup Oval Pitcher CR6000	Caraffe	Carbon	N/A	19 including chlorine, particulates, taste and odor, 2,4-D, atrazine, VOCs, cadmium, copper, cysts, lindane, mercury, MTBE, simazene, tetrachloroethylene, toxaphene, TTHM	\$82	\$30	www.purwaterfilter.com , 1-800-787-5463	Avg. Rating Reader Comments Rate/Review This Product
Pur Horizontal FM 9400	Faucet Mount	Carbon	63	30 including chlorine, particulates, tastes and odor, 2,4-D, atrazine, VOCs, cysts, lead, lindane, MTBE, mercury, simazene, TTHM, tetrachloroethylene, toxaphene	\$80	\$40	www.purwaterfilter.com , 1-800-787-5463	Avg. Rating 2 Reader Comments Rate/Review This Product
GE Smartwater GXFM03C	Faucet Mount	Carbon	54	8 including atrazine, cysts, lead, lindane, mercury, turbidity, chlorine*, particulates*	\$64	\$20	www.geappliances.com , 800-626-2005	Avg. Rating Reader Comments Rate/Review This Product
Brita Disposable CKFF-100	Faucet Mount	Carbon	50	13 including chlorine, particulates, taste and odor, atrazine, benzene, cysts, lead, mercury, toxaphene	\$0	\$40	www.brita.com , 1-800-24-BRITA	Avg. Rating Reader Comments Rate/Review This Product
Shaklee Best Water MTS2000	Counter Top	Carbon	88	8 including chlorine, particulates, taste and odor, cysts, lead, VOCs	\$105	\$255	www.shaklee.com , 925-924-2000	Avg. Rating Reader Comments Rate/Review This Product
Culligan CT-2	Counter Top	Carbon	72	9 including chlorine, particulates, taste and odor, cysts, lead, mercury	\$75	\$50	www.culligan.com , 1-800-CULLIGAN	Avg. Rating Reader Comments Rate/Review This Product
Sylvan Source Automatic Fill Distillation System M-600	Counter Top	Distiller	N/A	10 including arsenic, cadmium, copper, chromium, lead, mercury, selenium, TDS	\$0	\$38	www.sylvansource.com , 1-800-640-0469	Avg. Rating Reader Comments Rate/Review This Product
Aqua Pure by Cuno AP-DWS1000	Under Counter	Carbon	88	10 including chlorine, particulates, taste and odor, cysts, lead, MTBE, VOCs, pesticides*	\$180	\$350	www.cuno.com , 1-800-22-7880	Avg. Rating Reader Comments Rate/Review This Product
GE Smartwater GXSV65F	Under Counter	Carbon	78	13 including chlorine, particulates, taste and odor, atrazine, cysts, lead, lindane, mercury, VOCs, rust*	\$80	\$150	www.geappliances.com , 800-626-2005	Avg. Rating Reader Comments Rate/Review This Product
Everpure H-300	Under Counter	Carbon	71	14 including chlorine, particulates, taste and odor, cysts, lead, VOCs, chloramine*, mold and algae*, oxidised iron*, manganese sulfides*	\$95	\$300	www.everpure.com	Avg. Rating Reader Comments Rate/Review This Product
Doulton Ultracarb IP200UC	Under Counter	Ceramic/carbon	N/A	7 including chlorine, particulates, taste and odor, cysts, lead	est. \$40	\$319	www.doultonusa.com , 1-888-664-3336	Avg. Rating Reader Comments Rate/Review This Product
Kenmore Elite 38556	Under Counter	Reverse Osmosis	75	13 including arsenic, cadmium, chromium, copper, cysts, lead, nitrates, selenium, TDS	\$80	\$300	www.kenmore.com , 800-349-4358	Avg. Rating Reader Comments Rate/Review This Product
Culligan Aqua-Clear Good Water Machine AC-30	Under Counter	Reverse Osmosis	73	10 including arsenic, cadmium, copper, cysts, fluoride, chromium, lead, radium, selenium, TDS	\$50	\$900	www.culligan.com , 1-800-CULLIGAN	Avg. Rating 1 Reader Comment Rate/Review This Product
Whirlpool WHCF-DWHV	Whole House	Carbon	43	particulates	\$24	\$35	www.whirlpool.com , 866-698-2538	Avg. Rating Reader Comments Rate/Review This Product
TrojanUVMax Pro 20	Whole House	UV	N/A	5 including E.coli, giardia, cryptosporidium	\$0	est. \$1,600	www.trojanuvmax.com , 1-888-220-6118	Avg. Rating Reader Comments Rate/Review This Product

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*Manufacturer claims the filter removes this contaminant, although the filter has not been certified by NSF to do so.

Before You Buy

To ensure that the filter you buy is effective, find out which contaminants are specific to your water supply before you start shopping.

- If you draw from a municipal supply, obtain a copy of your water quality report. Water utilities are required to send these to customers by July first each year. If you have not received a copy, request it from your local supplier or the EPA's Safe Drinking Water Hotline (800-426-4791), or you can view it online at www.epa.gov/safewater/dwinfo.htm.
- If your water source is a private well, check with your local health department to find out which contaminants are common where you live. The EPA recommends that you have it tested annually by a state-certified lab for nitrate and coliform bacteria, total dissolved solids and pH levels. Also, test for radon (call 800-SOS-RADON to see if it's an issue in your area) and for pesticides, if you live near a farm where crops are sprayed frequently. National Testing Labs can test for 95 contaminants, including 20 pesticides, by mail (www.ntllabs.com, 800-458-3330). For more information, call the Water Systems Council hotline (www.wellcarehotline.org, 888-395-1033).
- Check for lead in your building's pipes. The NSF certifies reverse osmosis systems, carbon filters and distillers for the removal of lead, a neurotoxic heavy metal that gets into water as pipes decay. It's not present in all pipes, so find out if it's a problem before spending money on a costly filter. You can get the name of a state-certified laboratory from www.epa.gov/safewater/labs/index.html.

Choosing the Best Water Filter

Filters only reduce selected contaminants, so be sure you know which pollutants you're targeting before purchase, and select a filter certified by the National Sanitation Foundation (NSF), as all the above filters are. When a product effectively reduces at least 93 percent of a particular contaminant, NSF certifies the filter for reduction of that contaminant.

Following are basic criteria to use when choosing a water filter:

Type

Carafe: Portable pour-through carafes are the simplest and cheapest filtration option. They use carbon filters, and most models require a filter change about every two months. For basic filtering and taste improvement, Brita pitchers work fine. Pur filters remove a wider variety of contaminants, but Consumer Reports testing found that they clog easily. However, in areas with herbicides or other chemical contaminants that Brita filters can't remove, Pur is the least costly option.

Faucet Mount: Faucet-mounted filtration systems also use carbon filters but eliminate the wait times associated with carafes. The filter cartridges should be changed every three months.

Counter Top: Counter-top models are either manual-fill units, or they're filled via a tube connected to your faucet. They generally use either carbon filters or distillation.

Under Counter: Under-counter systems attach to the water pipes under your sink and provide hot or cold filtered water through your existing tap or a separate faucet (filter units requiring a separate faucet usually have high installation costs). The water flow with these systems tends to be better than with faucet-mounted systems, and filters generally only need changing twice a year.

Whole House: Whole-house systems filter all household water, whether used for bathing, washing or drinking, before it comes into the home. When sediment in water is a problem, whole house systems can in fact prolong the life of major appliances, but they usually are ineffective at removing lead, chloroform, pesticides and bacteria.

Portable Filters: Some reusable water bottles come equipped with a filtration system inside the bottle. Most remove chlorine, bad tastes and odors, as well as an assortment of heavy metals including lead, mercury, and copper.

Filtration Method

Carbon: These use activated carbon to adsorb lead, chlorine byproducts, certain parasites, radon, solvents, some pesticides and herbicides and some organic chemicals as well as odors and bad tastes. They won't remove heavy metals, arsenic, nitrites, bacteria or microbes.

Distiller: Distillers boil water into steam, then condense it back into water in a separate chamber, leaving behind particles and total dissolved solids. Since water is heated, distillers kill microbes. They eliminate many other pollutants including trivalent arsenic, fluoride, lead and mercury, but not volatile organic compounds (VOCs) and

chlorine, which are usually removed by an accompanying carbon filter. Upfront costs for distillers are steep, between \$200 and \$1500. They also use considerable amounts of energy: It takes one kilowatt-hour of electricity to produce one liter of distilled water. Because the average person consumes 100 gallons of water per day, a whole-house distiller can increase daily home energy use by 378 kWh. If heavy metals are a problem, consider a counter-top distiller for your drinking water only. Distilled water contains less dissolved oxygen, and many find that the water tastes flat.

Reverse Osmosis: Reverse-osmosis systems, typically expensive and difficult to install, operate by pushing water through a membrane, then flushing away a few gallons of contaminant-containing water for every gallon purified. These systems are the only filters that remove nitrates and perchlorate. They also remove industrial chemicals, heavy metals, chlorine byproducts, arsenic and asbestos but not radon or 100 percent of pesticides, which can be removed by an additional carbon filter. (As these filters waste enormous amounts of water and flush contaminants back into the water supply, they should be considered a solution to water contamination only if nitrates and perchlorate are problems in your area). The membrane generally needs to be replaced every two to three years.

Ceramic: Ceramic filters, often combined with carbon filters, will remove bacteria, parasites, asbestos and sediments. As water passes through the pores of the ceramic, particles as small as .2 microns are trapped. When the water flow is reduced, the filter requires a light scrub under running water. Ceramic filters are available in both counter-top and under-counter models.

UV: UV filters use a 60-watt ultraviolet light bulb to kill Giardia, E.coli and Cryptosporidium, and are currently the only systems certified by the NSF to do so. Although the bulb is continuously lit, UV systems are more energy-efficient than distillers and are available in under-counter and whole-house units. UV purifiers are not certified to remove particulate matter, pesticides or metals and should be used in conjunction with another filtration method.

Consumer Reports Rating

Consumer Reports rates water filters based mainly on effectiveness in removing chloroform, which indicates how well filters will remove organic compounds and byproducts from water system disinfectants, such as chlorine. Ratings are also based on removal of lead and off-tastes as well as flow rates and resistance to clogging.

Contaminants Removed

Contaminants vary for each water supply, but those most frequently found include:

2,4-D: a common herbicide and suspected hormone disruptor

Arsenic: a heavy metal that has been linked bladder, lung, kidney, prostate and skin cancer in animal tests, heart and nervous system damage and skin problems; can enter water through natural soil deposits or industrial and agricultural pollution. Very low levels of arsenic have also been found to disrupt hormone functions.

Atrazine: an herbicide used on corn; short-term exposure leads to lung, kidney and heart congestion while long-term exposure may cause cardiovascular disease. Atrazine is a suspected hormone disruptor.

Chloramine: a chlorine-ammonia compound used as a disinfectant in 29 percent of U.S. water utilities; has been associated with asthma, rashes and fainting

Coliform bacteria: Not harmful in themselves, they may indicate the presence of dangerous microbes such as Cryptosporidium, which can be life-threatening to people with weak immune systems.

Cysts: microorganisms including Cryptosporidium and Giardia that are carried by animal and human waste and linked to gastrointestinal illness; Crypto can be life-threatening for those with weakened immune systems.

E.coli: a type of fecal coliform bacteria that can cause gastrointestinal illness; about 2 to 7 percent of E.coli infections lead to kidney failure.

Lead: a brain-damaging and neurotoxic heavy metal that can enter water via decaying pipes and taps; "Every homeowner, especially if they have children under six, should have their water tested for lead," warns Erik Olson, a senior attorney specializing in drinking water at the Natural Resources Defense Council.

Lindane: used as an insecticide and in prescription medications for head and body lice; a known hormone disruptor

Mercury: a brain-damaging heavy metal that can also cause kidney damage

Misc. heavy metals: Carcinogenic chromium can also cause upset stomach, ulcers, kidney and liver damage,

and death. Short term exposure to selenium, cadmium and copper can cause nausea, vomiting and diarrhea, and long term exposure to cadmium and copper can cause kidney disease.

MTBE: The gasoline additive Methyl Tertiary-Butyl Ether leaks into groundwater from underground fuel storage, spills and storm-water runoff and is a possible carcinogen. MTBE has been banned in many but not all states.

Nitrates: come from animal waste on cattle farms, on feedlots and in dairies, and can cause "blue-baby syndrome," which prevents blood from holding oxygen.

Perchlorate: contaminant derived from rocket fuel; causes thyroid damage and is a possible carcinogen

Perchloroethylene (PERC)/tetrachloroethylene: PERC, also commonly listed as tetrachloroethylene, is the main solvent used in most dry-cleaning processes. It is a known carcinogen that can cause neurological, kidney and liver effects, and has been associated with reproductive effects such as spontaneous abortion.

Simazine: a common pesticide; long-term exposure may lead to liver and kidney damage

Trihalomethanes (THMs): Chemicals formed when chlorine used to disinfect water reacts with organic matter, such as animal waste, treated sewage or leaves and soil. They can increase the risk of cancer and may damage the liver, kidneys and nervous system, and increase rates of miscarriage and birth defects.

Total Dissolved Solids (TDS): inorganic salts, such as calcium, sodium and sulfates, and small amounts of organic matter that are dissolved in water; the concentration of TDS in water is not a health hazard but can cause water to be corrosive or salty in taste and may lead to mineral build-up.

Toxaphene: a now-banned insecticide that breaks down slowly in the environment and is an EPA-classified probable carcinogen; high level exposure could damage the lungs, nervous system and kidneys.

VOCs: including benzene, which can cause cancer and birth defects and toluene, which can cause nausea, weakness, confusion and hearing and vision loss

Annual Filter Cost

The dollar amount refers to the cost of replacing filters for one year.

At Home

- Change the filter on time to ensure that water is being cleared of contaminants. If need be, mark a reminder on your calendar.
- Continue to monitor your water reports or test your well water for contamination, especially in the event of unexplained illnesses, a chemical or fuel spill nearby, or if there is a change in water taste, odor, color or clarity.
- Weigh in with your water utility and local environmental groups to urge better protection against industrial and agricultural contamination of your city's water source. Campaign to limit development around reservoir watersheds, and buy organic food to support farming methods that prevent pesticides from entering water. The cleaner your watershed, the less you have to rely on filters.

The Backstory

Many of us rely on our state and local officials to ensure that the water coming out of our taps is clean and safe. They test water quarterly for synthetic organic chemicals and hundreds of times a month for bacteria, and municipal testing is actually more stringent than that required for bottled water, which is only tested annually. Nevertheless, a few localized problems with municipal supplies cast doubt on the entire nation's, leading consumers to opt for bottled water. Popular also because it's more convenient and may taste better, bottled water still costs 1,000 times more per gallon than tap, isn't as closely regulated and contributes to a host of environmental hazards.

Environmental Issues

Bottled water consumes 1.5 million barrels of oil annually in the production of convenient, disposable, petroleum-based plastics. Even though most plastic water bottles are recyclable, they're usually thrown out. The Container Recycling Institute estimates that each day, more than 60 million plastic bottles are incinerated or tossed in landfills.

Meanwhile, the contents of those bottles may be no different than the water coming out of your tap. As much as 40 percent of bottled water is actually drawn from municipal water supplies. PepsiCo has recently admitted as much by labeling it's Aquafina as coming from "a public water source" and then shipped cross-country, spewing greenhouse gases and burning more non-renewable oil in the process.

Water filters themselves create solid waste in the form of disposed plastic cartridges, which add to landfill problems. Unfortunately, water filters aren't recyclable and manufacturers currently don't have take-back programs designed to keep used water filters out of landfills.

Personal Health

People often turn to bottles because of threats to municipal supplies, the greatest of which is development, whether agricultural or urban, around reservoirs. Urban development seals green spaces under impervious roadways and parking lots, resulting in increased pollution from topsoil, lawn pesticides and fertilizers, animal and human waste (especially if septic systems fail), roadway oil, soot, landfill run-off and salt. Additionally, agricultural run-off carries pesticides into water supplies. A February 2007 U.S. Geological Survey survey of 51 "hydrological systems" found that one or more pesticides have been detected in 97 percent of U.S. streams in urban and farming areas, and five percent of shallow wells that provide drinking water in urban areas have pesticide concentrations above EPA human-health benchmarks.

Aside from industrial and agricultural pollution, chemicals not removed from wastewater treatment plants can infiltrate water supplies as well. A May 2002 USGS study of the nation's stream water discovered chemicals found in drugs, detergents, disinfectants, insect repellents, plastics, and personal care products, including 33 suspected hormone disruptors. Non-prescription drugs were detected more frequently than almost all other organic wastewater contaminants, and those drugs have been detected in drinking-water supplies in Montana and New Jersey.

The EPA reported in 1998 that 6 percent of the country's water systems had violated health standards for at least one of 90 regulated contaminants that year. According to the Natural Resources Defense Council, an estimated 7 million Americans are made sick annually by contaminated tap water; in some rare cases, this results in death. One study published in the 2006 Journal of Water and Health found that, between 1991 and 2002, 4,400 people were hospitalized and 50 died from exposure to pathogens such as Cryptosporidium and E.coli in tap water.

Resources and References

GG Resources

"Lead, Straight From the Tap,"
www.thegreenguide.com/doc/ask/leadwater

"American Waters: What Hurts, What Helps,"
www.thegreenguide.com/doc/121/water

"Three Simple Steps to Clean, Safe Drinking Water,"
www.thegreenguide.com/doc/101/threesteps

"Message in the Bottle: Drink Tap,"
www.thegreenguide.com/doc/101/watershed

Resources

Campaign for Safe and Affordable Drinking Water:
www.safe-drinking-water.org, 202-895-0432 x135

Clean Water Lead Testing Inc. provides lead testing for \$24: www.leadtesting.org, 828-251-6800

Consumer Reports' water filter ratings:
www.consumerreports.org

EPA's Safe Drinking Water Hotline: www.epa.gov, 800-426-4791

National Drinking Water Clearinghouse:
www.nesc.wvu.edu, 800-624-8301

National Testing Labs: www.ntlabs.com, 800-458-3330

National Sanitation Foundation: www.nsf.org, 800-673-6275

Radon Hotline: 800-SOS-RADON

Water Systems Council: www.wellcarehotline.org, 888-395-1033

References

"Deciphering your water report: Can you have the confidence in the water you drink at home?" Consumer Reports, May 2007. www.consumerreports.org

Making Sense out of Drinking Water "Right to Know" Reports. www.safe-drinking-water.org/rtk.html

Olson, Erik D. "Bottled Water: Pure Drink or Pure Hype?" Natural Resources Defense Council. 1999.
www.nrdc.org/water/drinking/bw/exesum.asp

"Protecting Groundwater from Pesticides: A Clean Water Action Guide." Friends of the Earth.
www.foe.org/safefood/groundwater

