

Water Purification Systems and Air Purification Systems

By Tamar Clarke

September 27, 2019, Updated October 18, 2019

The purpose of this presentation is to give an overview of water and air purification systems and what is out there. Individual needs may vary depending what is in your environment and what causes health issues. It is no means a comprehensive overview. The costs also can vary considerably.

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Opening

- As we become more aware of the pollution that is affecting our water supply as well as the air we breathe, we look towards devices that can remove the toxins and unsafe chemicals from water and from air.
- Before purchasing a water filtration system, it helps to know what are some of toxins and unsafe ingredients in your area (municipal or rural). The next few slides indicate some of the types of substances found in water.
- The same is true for air filters.

Section on Water Purification Systems

TOP 10 REASONS TO FILTER DRINKING WATER:

ARSENIC, PHARMACEUTICAL DRUGS,
FLUORIDE AND MORE



ARSENIC



PRESCRIPTION
DRUGS



CHLORINE



FLUORIDE



ROCKET FUEL



AGRICULTURAL
CHEMICALS



FRACKING



ENDOCRINE
DISRUPTORS



URBAN POLLUTION



BY-PRODUCTS
OF WATER
TREATMENT

Graphic on Substances Found in Water

Source: Grocerysecrets.com

Heavy Metals found in water

- Aluminum
- Antimony
- Arsenic
- Barium
- Cadmium
- Chromium
- Chromium-6 (Hexavalent)
- Cobalt
- Copper
- Lead
- Manganese
- Mercury
- Molybdenum
- Nickel
- Thallium
- Vanadium

Source: https://berkeyfilters.healthrangerstore.com/berkey-water-filters.html?utm_source=aimtell&utm_medium=push&utm_campaign=BerkeyPromo0110

Petroleum Contaminants found in water

- Crude Oil
- Diesel
- Gasoline
- Kerosene
- Mineral Spirits
- Refined Oil

Source: https://berkeyfilters.healthrangerstore.com/berkey-water-filters.html?utm_source=aimtell&utm_medium=push&utm_campaign=BerkeyPromo0110

Pharmaceuticals Found in Water

- Acetaminofen
- Bisphenol-A
- Caffeine
- Carbamazepine
- Ciprofloxacin HCL
- Diclofenac Sodium
- Erythromycin USP
- 4-para-Nonylphenol
- 4-tert-Octylphenol
- Gemfibrozil
- Naproxen Sodium
- Primidone
- Progesterone
- Triclosan
- Trimethoprim

Source: https://berkeyfilters.healthrangerstore.com/berkey-water-filters.html?utm_source=aimtell&utm_medium=push&utm_campaign=BerkeyPromo0110

Radiologicals found in our water

- Americium-241
- Californium-251 & -252
- Cesium
- Iodine-129 & -131
- Mendelevium-258
- Neptunium-237
- Plutonium-238 & -239
- Polonium-210
- Promethium-145
- Protactinium-231
- Radium-226 & -228
- Strontium-90
- Technetium-99
- Thorium-232
- Uranium-235 & -238

Volatile Organic Compounds Found in Water (and air)

- **Volatile organic compounds (VOCs)** are [organic chemicals](#) that have a high [vapor pressure](#) at ordinary [room temperature](#). Their high vapor pressure results from a low [boiling point](#), which causes large numbers of molecules to [evaporate](#) or [sublimate](#) from the liquid or solid form of the compound and enter the surrounding air, a trait known as [volatility](#). For example, [formaldehyde](#), which evaporates from [paint](#) and releases from materials like [resin](#), has a boiling point of only -19°C (-2°F).
- VOCs are numerous, varied, and ubiquitous. They include both human-made and naturally occurring chemical compounds. Most [scents or odors](#) are of VOCs. VOCs play an important role in communication between plants, [\[1\]](#) and messages from plants to animals. Some VOCs are dangerous to human health or cause harm to the [environment](#). [Anthropogenic](#) VOCs are regulated by law, especially indoors, where concentrations are the highest. Harmful VOCs typically are not acutely [toxic](#), but have compounding long-term health effects. Because the concentrations are usually low and the symptoms slow to develop, research into VOCs and their effects is difficult.
- Hundreds were listed, too many to include in this PowerPoint
- Source: https://en.wikipedia.org/wiki/Volatile_organic_compound

Volatile Organic Compounds (VOCs) - Removed to below Lab detectable limits

1,1,1,2-Tetrachloroethane	Dicamba	Aldicarb	Monochlorobenzene
1,1,1-Trichloroethane (TCA)	Dichloroacetic Acid	Aldicarb Sulfone	m-Xylenes
1,1,2,2-Tetrachloroethane	Dichlorodifluoromethane (CFC 12)	Aldicarb Sulfoxide	Naphthalene
1,1,2-Trichloroethane	Dichloromethane	Aldrin	Napropamide
1,1,2-Trichlorotrifluoroethane	Dichlorvos	alpha-Chlorodane	n-Butylbenzene
1,1-Dichloroethane (1,1-DCA)	Diclorprop	Ametryn	Norflurazon
1,1-Dichloroethylene (1,1-DCE)	Dieldrin	Aroclor (1016, 1221, 1232, 1242, 1248, 1254, 1260)	n-Propylbenzene
1,1-Dichloropropene	Dinoseb	Atraton	Oxamyl
1,2,3-Trichlorobenzene	Diphenamid	Atrazine	o-Xylene
1,2,3-Trichloropropane	Disulfoton	Baygon	Pebulate
1,2,4-Trichlorobenzene	Disulfoton Sulfone	Bentazon	Pentachlorophenol
1,2,4-Trimethylbenzene	Disulfoton Sulfoxides	Benzene	Picloram
1,2-Dibromo-3-chloropropane (DBCP)	Endrin	Bromacil	Prometon
1,2-Dibromoethane	EPTC	Bromosacetic Acid	Prometryn
1,2-Dichloro-1,1,2-trifluoroethane (CFC 123a)	Ethoprop	Bromobenzene	Pronamidea
1,2-Dichlorobenzene	Ethylbenzene	Bromochloromethane	Propazine
1,2-Dichlorobenzene-d4	Ethylene Dibromide (EDB)	Bromodichloromethane	p-Xylenes
1,2-Dichloroethane	Fenamiphos	Bromomethane	sec-Butylbenzene
1,2-Dichloropropane	Fenarimol	Bromoform	Simazine
1,3,5-Trimethylbenzene	Fluorobenzene	Butachlor	Simetryn
1,3-Dichlorobenzene	Fluridone	Butylate	Stirofos
1,3-Dichloropropene	gamma-Chlorodane	Carbaryl	Styrene
1,4-Dichlorobenzene	Glyphosate	Carbofuran	Tebuthiuron
2,2-Dichloropropane	Halo acidic Acids (HAA5)	Carbon Tetrachloride	Terbacil
2,4,5-T	Heptachlor	Carboxin	Terbufos
2,4,5-TP (Silvex)	Heptachlor Epoxide	Chloramben	Terbutryn
2,4-D	Hexachlorobenzene	Chlordane	tert-Butylbenzene
2,4-DB	Hexachlorobutadiene (CCB)	Chloroacetic Acid	Tetrachloroethylene (PCE)
2-Butanone (MEK)	Hexachlorocyclopentadiene	Chlorobenzene	Tetrahydrofuran (THF)
2-Chlorotoluene	Hexazinone	Chloroethane	Thiobencarb
2-Hexanone	Isopropylbenzene (Cumene)	Chloroform	Toluene
2-Methyl-2-propanol	Lindane (Gamma-BHC)	Chloromethane	Toxaphene
3,5-Dichlorobenzoic Acid	Merphos	Chloropropan	trans-1,2-Dichloroethylene
3-Hydroxycarbofuran	Methiocarb	cis-1,2-Dichloroethylene	trans-1,3-Dichloropropene
4-Bromofluorobenzene	Methomyl	cis-1,3-Dichloropropene	trans-Nonachlor
4-Chlorotoluene	Methoxychlor	cis-Nonachlor	Triademeton
4-Isopropyltoluene	Methyl Paraoxon	Cycloate	Tribromoacetic Acid
4-Methyl-2-pentanone	Methyl tert-Butyl Ether (MTBE)	Dacthal Acid	Trichloroacetic Acid
4-Nitrophenol	Metolachlor	Dalapon	Trichloroethane (TCE)
5-Hydroxydicamba	Metribuzin	Diazinon	Trichloroethylene
Acetone	Mevinphos	Dibromoacetic Acid	Trichlorofluoromethane (CFC 11)
Acifluorfen	MGK 264	Dibromochloropropane (DBCP)	Tricyclazole
Alachlor	Molinate	Dibromomethane	Vernolate
			Vinyl Chloride

Examples of Substances
Found in Water in more
Detail

Source: https://berkeyfilters.healthrangerstore.com/berkey-water-filters.html?utm_source=aimtell&utm_medium=push&utm_campaign=BerkeyPromo0110

Other compounds found in water (including bottled water)

- Arsenic:
 - A heavy metal that has been found in bottled water is arsenic. It was found in water sold by Whole Foods. Issues with arsenic are:
 - Liver disease
 - Cancer
 - Coma and even death
 - Arsenic can harm an unborn child through the mother.
 - Arsenic also bioaccumulates in the body.
- Fluoride
 - Fluoride is an industrial waste that is added to municipal water systems.
- Microplastics are another type of substance that can be found in bottled water.

Source: <https://articles.mercola.com/sites/articles/archive/2019/07/31/bottled-contaminated-with-arsenic-and-pfas.aspx>

Other compounds found in water (including bottled water) continued

- PFAS
 - One substance found in water is PFAS as they are persistent in our environment. It stands for per- and polyfluoroalkyl substances.
 - The EWG (Environmental Working Group) maintains an interactive map of water supply contamination in the U.S.
 - PFAS are man-made chemicals that repel water and oil. It does not break down in the environment or the human body.
 - The effects of PFAS are:
 - Affect children's ability to grow and learn
 - Reduce fertility in men and women
 - Interfere with hormone levels
 - Alter the immune system
 - Increase risk of high cholesterol, high blood pressure and certain cancers.

Note #1: The EPA in the United States regulate tap water and groundwater.

Note #2: The FDA in the United States regulates bottled water.

Source: <https://articles.mercola.com/sites/articles/archive/2019/07/31/bottled-contaminated-with-arsenic-and-pfas.aspx>

Test Conducted	Result
Pathogenic Bacteria and Cysts (E. Coli, Klebsiella, Pseudomonas Aeruginosa, Giardia, Cryptosporidium, Raoltella Terrigena, Bacillus Atrophaeus)	Reduced to > 99.9999%
Viruses (MS2 - Fr Coliphage)	Reduced to > 99.999%
Parasites	Reduced to > 99.9999%
Pharmaceuticals - (see table)	Reduced to > 99.9%
Chlorine	Removed to Below Detectable Limits
Chloramines	Reduced to > 99.9%
Perfluorochemicals	Reduced to > 99.9%
BPA	Reduced to > 99.9%
Nitrites	Removed to > 95%
Glysophate	> 75% (75% was reporting limit of testing equipment. Removal rate may be higher)
THM's (Trihalomethanes - Bromodichloromethane, Bromoform, Chloroform, Dibromochloromethane)	Removed to Below Detectable Limits
MTBE's (Methyl tert-Butyl Ether)	Removed to Below Detectable Limits
Other VOC's	Removed to Below Detectable Limits
Radiologicals - See Table below	Removed up to 99.8%
Selenium and Thallium	95% and greater
Heavy metals	99% and greater



Testing by a Third Party Source on the Berkey Water System

Source: Berkey Water Filters

Various Types of Water Filters

- Bath Filters
- Countertop Filters
- Pitcher Filter
- Portable Camping
- Refrigerator
- Replacement Filters
- Reverse Osmosis
- Shower Filters
- Under sink Filters
- UV Sterilizer
- Water Filter Bottles
- Whole House

Water Filter System: Berkey Water System






- This company has a number of different water purification models. It depends on the use and the number of people in the household, to be used for drinking and cooking.
- The prices range from \$250 to \$300 plus the cost of the filters.
- The black filters are replaced on an annual basis and the white filters filtering arsenic and fluoride every six months.
- Third party testing

Water Filter System: Berkey Shower Head Filter

- As chemical sensitivities increases, so does sensitivity to the chemicals found in municipal water. This includes sensitivity to fluoride and chlorine.
- A filter can be placed with a shower head to remove these contaminants.



Water Filter System: Propur Water Filter



PROPUR BIG GRAVITY WATER FILTER WITH 2 G2.0 7" FILTER ELEMENTS

☆☆☆☆☆ No reviews

\$237.15

Qty: [ADD TO CART](#)

[Ask a Question](#)

Type: Countertop Filters
Vendor: Propur
SKU: P3-202POG

Description:

The Propur® Big is essential for an emergency preparedness plan for you and your family. It is economical, convenient and easy to use. The system requires no electricity to provide reliable water filtration just about anywhere whether at home, office, vacation, camping or college dorms! Works with just about any water source including tap, lake, river, stream, pond and rain water.

Water Filter System: Propur Water System

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Ideal for emergency or daily use. Each container is made from high quality premium 304 stainless steel for lasting durability, corrosion and oxidation resistance and attractive appearance. The system comes equipped with two ProOne® G2.0 7" All-In-One contaminants & fluoride filter elements and can be expanded up to three filters.

Water Filter System: Propur Water System

Propur® Big system features include:

- Recommended for 2-4 people
- 2.75 gallon capacity
- Standard # of filters: 2
- Maximum # of filters: 3
- Height: 22.5"
- Diameter: 9.25"
- High quality premium 304 polished stainless steel
- Embossed with the Propur® 304 logo
- Includes 2 ProOne® G2.0 7" filter elements
- Includes solid 304 stainless steel spigot and non-slip pad

Water Filter System: Propur Water System

The ProOne® G2.0 filters for the Propur® Big







- Filter element size is 2.75" x 7"
- Recommended replacement for 2 ProOne® G2.0 7" filter elements: up to 12 months
- Most economical "All-In-One" contaminants & fluoride filter element
- Removes fluoride, heavy metals, contaminants, glyphosate and more
- Silver infused to help prevent growth of bacteria
- NO priming required
- Easy to clean
- Leaves good minerals, including calcium, in water
- Nut and Alumina Free

Water Filter System: AquaGear Water Pitcher



- This is one water pitcher systems with testing results.
- The filters are replaced periodically and can be mailed to your home.
- Source:
<https://www.goaquagear.com/products/waterfiltrationpitcher>

Water Filter System: Brita Water Pitcher

		
FEATURED	MOST POPULAR	
Monterey with Longlast Filter	Grand	Lake
\$39.99	\$36.99	\$29.99
★★★★★	★★★★★	★★★★★
		
10 cup capacity	10 cup capacity	10 cup capacity
One Longlast Filter used = 900 plastic bottles saved	Most popular pitcher size	Space-efficient design
Compatible with Brita Longlast® and Standard filters	Compatible with Longlast and Standard filters	Compatible with Longlast and Standard filters

Source:

<https://www.brita.com/water-pitchers/>

Water Filter System: Water Pitchers (Others)



New Wave Alkaline Plus Lead Removal Water Filter Pitcher

☆☆☆☆☆ No reviews

Enjoy an inexpensive, portable option for filtered water! The New Wave Alkaline Plus Lead Re...



Propur Water Filter Pitcher (Reduces Fluoride)

☆☆☆☆☆ No reviews

Propur™ Water Filter Pitcher Benefits Remarkably Clean and Healthy Water Removes more contaminant...



Seychelle pH2O Pure Alkaline Water Filter Pitcher

★★★★★ 2 reviews

The pH2O PUREWATER filter increases the pH of drinking water from 7.0 up to 9.5*. The filter re...



Seychelle Radiological Water Filter Pitcher

☆☆☆☆☆ No reviews

The new filter removes the four basic zones of contamination: Aesthetic (Chlorine, taste and odor...

Gravity Water Filter/Purifier Comparison Chart

Company	NMCL	AquaCera	AquaCrock	Pro Pur	Doulton	Aqua Rain	Katadyn
Model	Big Berkey	Ceragrav-LP5	AquaCrock	Pro Big	GSS-2	Model 400	Gravidyn
Virus Removal [A]	Yes	No	No	No	No	No	No
Element Rating	Purifier [A]	Filter	Filter	Filter	Filter	Filter	Filter
Base System Cost	\$263	\$139	\$399	\$239	\$229	\$239.99	\$219.95
Max Daily Output (Gal/Day) Base	84	10	18	9	14	12	24
Max Daily Output-Max # Elements	168	25	18	18.5	20	24	24
Approx. People Served [B]	42	6	5	4	5	6	6
Maximum Gallons/Element	3,000	535 [C]	535 [C,D]	1,500 [E]	535 [C]	1095 [F]	730 [G]
Replacement Time Limitation	No Time Limit	6 Months [C]	2 Years [C,D]	12 Months [E]	6 Months [C]	1 year [F]	Up to 6 months
Price of Elements (Each)	\$54.50	\$30.00	\$36.00	\$49.50	\$36.00	\$42.99	\$56.00
Approx Cost Per Gallon (Cents)	1.8	5.6 [H]	6.7 + electric [H]	3.3 [H]	6.7 [H]	3.9 [H]	7.6 [H]
Maximum Element Capacity	4	5	3	4	4	4	3
Food Color Test [I]	Pass	Fail	Fail	Pass	Fail	Fail	Fail
Turbidity Flow Rate Test [J]	Pass	Pass	Pass	Pass	Pass	Fail	Pass
Test Results Available	Yes	Yes	Yes	No	Yes	Yes	Yes
Tested to NSF Standards	Yes	Yes	Yes	Yes	Yes	Yes	Yes
NSF Certified Claimed	No	No	No	Yes [K]	No	No	No
Guarantee	6 Mos (elem 2-Yr)	None Published	1 Year Ltd.	2 Year	None Published	None Published	None Published
System Cost-Max Elements	\$363	\$274	\$399	\$338	\$299	\$319.99	\$219.95
System Material	AISI 304 Stainless	HDPE	Ceramic	Stainless	AISI 304 Stainless	Stainless	Silicone
System Production	Plasma Welded	Molded	Kiln	Deep Drawn	Plasma Weld	Deep Drawn	Molded
OTHER INFORMATION							
Element Composition	Proprietary Formula	Ceramic/Carbon	Ceramic/Carbon	Ceramic/Carbon	Ceramic/Carbon	Ceramic/Carbon	Ceramic/Carbon
Number of Elements	2	2	3	2	2	2	3
Element Height	9"	7"	5"	9"	7"	~9"	10.4"
Elements cleanable	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Storage Tank Capacity (Gallons)	2.25	3.5	Not Stated	2.75	2.25	3	2.6
Electricity Required	No	No	Yes	No	No	No	No
Plumbing Required	No	No	No	No	No	No	No
Post Filters	Yes	Yes	Yes	Yes	Yes	No	No
Height	19.25"	28.5"	17.5"	21.5"	19.25"	20.5"	18"
Diameter	8.5"	11.25"	11"	9.25"	8.5"	11"	11"
Dry Weight (Approx.)	6 lbs	5 lbs	26 lbs	5 lbs	5.5 lbs	7 lbs	6.5 lbs

NOTES

Bottled Water

- If you are not able to have access to filtered water, there is bottled water.
- Most of the bottled water comes from natural springs or municipal sources.
- There are now a number of bottled water available. They can be purified, spring water, and distilled water.
 - Spring water – from a spring
 - Purified – water has been purified
 - Distilled – water has been boiled to the point of becoming steam
- With purified water, there is the question as to what ingredients are filtered. Also, a second question is how often is it tested for impurities.

Concluding Comments on Water Filters

- One, it helps to have your water tested to determine what substances are in the water. This includes both municipal and well water. It is suggested that it be done on a periodic basis.
- Two, select a system that fits your budget and types of substances that need to be filtered from your water.
- Three, there are specialized filters designed to filter specific types of substances. These (all) filters need to be replaced on a periodic basis.
- Four, it is suggested that you use a product that has a third party independent testing.
- Five, more information is in the appendix covering water filters and bottled water.

Section on Air Purification Filters

Questions to ask About Air Purifiers

- What are the substances that you need to filter out?
- What area needs to be covered? A room, a whole house, a commercial facility, industrial facility, or a medical facility?
- This presentation covers residential use and mainly covering a room.
- A whole house filtering system is much more expensive.
- Some air filtering systems cover specialized situations like the aftermath of a fire, mold issues, and etc.
- A filtering system requires ongoing maintenance.

Air Pollution Basics

- Air pollution occurs in two types of areas.
 - One, is outside known as outdoor pollution
 - Two, is air pollution that exists within indoors, especially in homes. It also occurs in the workplace.
- Exposure to Air pollution (levels of exposure)
 - Pollution that does not cause damage to living things
 - One that causes irritation when exposed
 - Pollution that if exposed for too long leads to chronic illness
 - Lastly, pollution that causes an acute reaction, even death

(Note: The focus of this PowerPoint is on indoor pollution, in our homes.)

Source: <https://azchemistry.com/harmful-chemicals-in-air-pollution>

Basic Types of Substances Found in our Air

Types of Substances

- Natural Substances
 - Dust
 - Mold
 - Pet Dander
 - Pollen
 - Radon
 - Volcanic Eruptions
- Synthetic Substances
 - Chemicals
 - Chemtrails
 - Cigarette and Cigar Smoke
 - Fumes from Paints
 - VOC – volatile organic compounds
- Radioactive Substances
 - Nuclear accidents
 - Radioactive testing (medical)

Sources of Substances

- Mobile Sources
 - Motor vehicle traffic
 - Sea transportation
- Stationary Sources
 - Power plants
 - Industries
 - Households

Source: <https://azchemistry.com/harmful-chemicals-in-air-pollution>

Basic Guidelines for Air Purification

- One, minimize air pollution sources such as cigarette smoke, fireplace smoke, dust, and animal dander. Outside sources include fumes from heavy traffic, pollen, industry, coal plants, chem trails, and other sources.
- Allergy testing can specify which substances are a problem.
- Also, test for mold is another suggestion.
- Volatile Organic Compounds include organic compounds from adhesives, paints, cleaning products, and other gaseous pollutions. It depends upon what the filters will clean or even specific VOCs.
- Change furnace filters frequently or as needed
- Maintain heating and cooling equipment
- Don't store chemicals, solvents, glues, cleaning products, and other types of gaseous products near living areas.

Air Filter Features

- Fan – Most air filters use a fan to suck in air (they work better than those without a fan). Keep in mind, the noise level of the unit.
- Servicing indicator – Feature lets you know when the filter needs to be cleaned or replaced
- Programmable time – You can specify when you need to have the air filter system to run
- Carrying handle – Makes it easier to move the unit from room to room
- Number of speeds- How much needs to be removed, less when sleeping and more doing high pollen season
- Ionizer – Is the use of electricity that attracts particles. (Some people may be sensitive to ozone if the unit produces ozone.)
- Remote control – Can adjust settings from a remote basis
- Dirt sensor – Unit can adjust fan speeds according to the level of dirt or dust in the air
- Washable prefilter – The benefits vary, whether to use a washable filter or replacement one.

Types of Air Purification Technology

- Techniques for purification
 - Active – Releases negatively charged ions into the air, causing pollutants to stick to surfaces
 - Passive- Uses air filters to remove pollutants, especially by size
- Some examples of air purification technology
 - HEPA – High-efficiency particulate air (or arrestance) removes 0.3 micrometer particles (or larger)
 - Ultraviolet germicidal irradiation - sterilizes air
 - Activated carbon – absorbs volatile chemicals on a molecular basis
 - Polarized-media electronic air cleaners used both electronic air cleaners and passive mechanical filters
 - Others

12 Harmful Chemicals in our Air

- Carbon Dioxide – result of complete combustion of carbon with oxygen in the combustion of coal, oil and gas in the industry
- Carbon monoxide-can replace oxygen
- CFC- carbon that binds with chlorine and fluorine atoms, a threat to ozone layer
- Chlorine – is a green gas with a stinging smell
- Gas Pb (lead) – produced by the burning of a motor vehicle
- Nitrogen dioxide – very toxic to the lungs
- Nitrogen Oxide – includes nitrogen monoxide and nitrogen dioxide, comes from motor vehicle fumes
- Particulate Dust – a small particle size of dust that can enter the lungs
- Sulfur dioxide (SO₂) – a compound derived from combustion of petroleum industry, coal, and other sources
- Sulfur trioxide – oxidized SO₂ and causes acid rain
- Tin – dangerous to children under the age of six, from paint

Examples of Air Purification Systems

Under \$75



Hamilton Beach (04384) Air Purifier, Odor Eliminator, Permanent HEPA Filter, For...
by Hamilton Beach

\$59⁹⁹ ✓prime

★★★★☆ ▾ 2,723

\$75 to \$100



LEVOIT LV-H132 Air Purifier with True HEPA Filter, Odor Allergies Eliminator...
by LEVOIT

\$89⁹⁹ ✓prime

★★★★☆ ▾ 2,399

\$100 & Above



Honeywell True HEPA Allergen Remover, 465 sq. Ft, HPA300
by Honeywell

\$172⁴⁹ ~~\$249.99~~ ✓prime

★★★★☆ ▾ 1,947

Examples of Air Purification Systems continued

Amazon's Choice for "air purifiers for home"



See Color Options

GermGuardian AC4825 22" 3-in-1 Full Room Air Purifier, True HEPA Filter, UVC Sanitizer, Home Air Cleaner Traps Allergens, Smoke, Odors, Mold, Dust, Germs, Pet Dander, 3 Yr Warranty Germ Guardian by Guardian Technologies

\$74⁹⁹ ✓prime
FREE Delivery by Sun, Dec 9

Save 5% with coupon

★★★★☆ ▾ 8,502

See newer version ▸

Home Gift Guide



See Size Options

LEVOIT LV-H132 Air Purifier with True HEPA Filter, Odor Allergies Eliminator for Smokers, Smoke, Dust, Mold, Home and Pets, Air Cleaner with Optional Night Light, US-120V, White, 2-Year Warranty by LEVOIT

\$89⁹⁹ ✓prime
FREE Delivery by Sun, Dec 9

More Buying Choices
\$66.20 (20 used & new offers)

★★★★☆ ▾ 2,399



Honeywell True HEPA Allergen Remover, 465 sq. Ft. HPA300

by Honeywell

\$172⁴⁹ ~~\$249.99~~ ✓prime
FREE Delivery by Sun, Dec 9

★★★★☆ ▾ 1,947

Examples of Air Purification Systems continued

Example of a company that sells various types of air filtration systems.



Air Purification Systems – Use of Plants

- One, plants used indoor can help with cleaning the air.
 - English Ivy (*Hedera Helix*)
 - Golden Pathos (*Epipremnum Aureum*)
 - Boston Fern (*Nephrolepis Exalta Bostoniensis*)
 - Dracaena (*Dracaena Deremensis*)
 - Bamboo Palm (*Chamaedorea seifrizii*)
 - Dragon Tree (*Dracaena Marginata*)
 - Peace Lily (*Spathiphyllum*)
 - Lady Palm (*Rhapis Excelsa*)
 - Spider Plant (*Chlorophytum Comosum*)
 - Snake Plant (*Sanserviera Trifasciata*)

Source: <https://www.healthyandnaturalworld.com/best-air-filtering-plants/>

Concluding Comments on Air Purification Systems

- The more informed all of us are on our exposure to air pollution, the more we can educate others and our legislators both on the federal and state level on the need for a strong EPA and clean air without ties to various industries not supportive of clean air and water. We can also take steps to protect ourselves from the dangers of air pollution.
- The dangers of air pollution are not just to our own health and the health of our communities, it is also a threat to our environment. They are:
 - Our health
 - Affects our crops and plants
 - Acid rain
 - Damage to the ozone layer
 - Greenhouse effect (causes global warming, too)

Note: Another consideration to keep in mind is the level of oxygen in the atmosphere. Apparently, in industrial areas, the levels are lower than what is found in rural areas. Everyone needs to be aware of this and it has direct impact on everyone's health.

Addendum

Addendum

- Bibliography
- Other Water Purification Technology
- Companies that Produce Water Filters
- Glossary
- Shower Filters (for water)
- Specialty Water Filters
- Twelve Major Toxins found in Water
- Water Bottles Containers
- Water Filter Bottles
- Water Filters Using Reverse Osmosis
- Water Testing Devices

Addendum: Bibliography

- <https://articles.mercola.com/sites/articles/archive/2019/07/31/bottled-contaminated-with-arsenic-and-pfas.aspx>
- <https://azchemistry.com/harmful-chemicals-in-air-pollution>
- <https://www.consumerreports.org/cro/air-purifiers/buying-guide/index.htm>
- <https://www.healthyandnaturalworld.com/best-air-filtering-plants/>
- Low Cost Emergency Water Purification Technologies: Integrated Water Security Series 1st Edition, Kindle Edition by [Chittaranjan Ray](#) (Author), [Ravi Jain](#) (Author)
- <https://www.youtube.com/watch?v=sFfLbeXDav8> (Web video comparing different types of water filters)

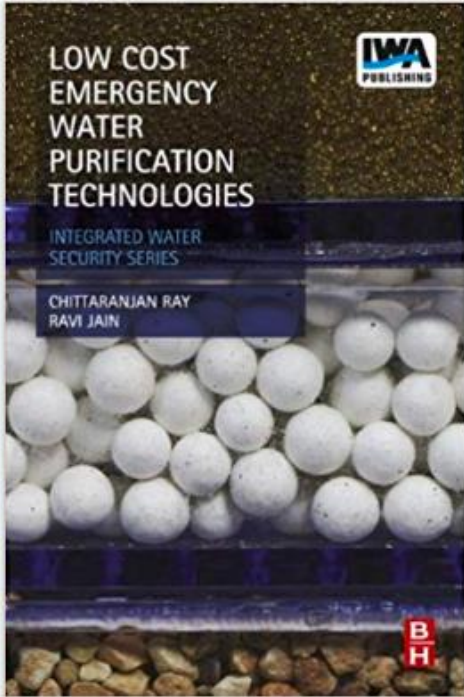
Addendum: Other Water Purification Technology

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by [Chittaranjan Ray](#) (Author), [Ravi Jain](#) (Author)

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Addendum: Companies that Produce Water Filters

- AquaCera
- Berkey
- Crystal Quest
- Environ Products
- Pelican Water Filters
- Propur Water Purification Systems
- Rainshowr Filters
- Saychelle
- Sprite Shower Filters
- Vitashower

Addendum: Glossary

- HEPA – HEPA: Acronym that stands for High-Efficiency Particulate Air and for High-Efficiency Particulate Arrestor. HEPA filters are used for isolation and immunocompromise units, operating rooms, removal of allergens from the air (for [hay fever](#), [asthma](#), etc.) and other applications where maximum reduction or removal of submicron particulate matter from air is required. being, using, or containing a filter usually designed to remove 99.97 percent of airborne particles measuring 0.3 micrometers or greater in diameter passing through it. How to use HEPA in a sentence.
- Radiologicals - (Nuclear Physics) of, relating to, or involving radioactive materials: *radiological warfare*.

Addendum: Glossary continued

- Total Quality Water Tester-A TDS meter (aka ppm pen, nutrient tester, tds stick) is an inexpensive and convenient digital tool to instantly check your overall water quality. TDS = Total Dissolved Solids, which is any salt, metal or mineral in the water. With the push of a button, the TDS-EZ can tell you your overall water purity level, which will be displayed on the screen in ppm (parts per million).
- The lower the TDS level, the purer the water, with 0 ppm being pure H₂O. The TDS-EZ is great for checking your tap water quality, or knowing when to change a filter. (The meter does not test for biological contaminants.) The TDS-EZ is a great tool for drinking water, water filtration and purification, hydroponics (test your nutrients), aquariums, RO/DI systems, pools and spas, and more.
- VOC - Volatile organic compounds from adhesives, paints, and cleaning products, and other types of gaseous pollutants, however, are another matter. Some portable models with carbon prefilters are claimed to filter VOCs, but the Environmental Protection Agency warns that such filters are specific to certain gaseous pollutants, not for others, and that no air purifier is expected to remove all gaseous pollutants found in the typical home. Carbon filters also must be replaced often, typically every three to six months, or they stop working.

Addendum: Shower Filters (for water)



Crystal Quest Combo
Handheld Shower
Filter Chrome or
White

☆☆☆☆☆ No
reviews

A Crystal Quest
handheld combo shower
filter gives you the ease
of showering with a
massage showe...



Crystal Quest
Handheld Shower
Filter Chrome or
White

☆☆☆☆☆ No
reviews

The Crystal Quest
Handheld Shower Filter
represents the current
peak of shower filtration
technol...



Crystal Quest
Shower Filter
Chrome With
Optional Massage
Shower Head

☆☆☆☆☆ No
reviews

There is no need to give
up the relaxing pleasures
of a optional massage
shower head when you
ins...



Crystal Quest
Shower Filter White
With Optional
Massage Head

☆☆☆☆☆ No
reviews

Saving you money on
moisturizers by
preventing chlorine from
stripping the natural oils
from your...

Addendum: Specialty Water Filters

SPECIALTY WATER FILTERS



Acid Neutralizing Filters



Alkaline Water Filters



Arsenic Water Filters



Fluoride Filters



Iron Water Filters



Lead Water Filters



Nitrate Water Filters

Addendum: 12 Major Toxins found in Water

- Arsenic (heavy metal) – used in a variety of industrial processes
- Chlorine – has disinfectant properties and used for cleaning and swimming pools
- Dacthal – a herbicide that contaminates the soil and water, still being used
- DDT – used as an insecticide in the 1940s, now banned, however, it persists in the atmosphere and can travel vast distances in the atmosphere
- Dioxins – released during combustion, such as burning of hazardous waste, forest fires, cigarette smoke, and burning oil and coal
- Fluoride – added to drinking water, it is a neurotoxin and harms the thyroid and calcify the pineal gland
- HCB – was used as a pesticide, has been banned. Still formed as a by-product from the production of other chemicals
- Lead (heavy metal) – from corroded pipes, very toxic, harmful to cardiovascular system and kidneys
- MtBE – a gasoline additive, and is able to pollute the ground water
- Mercury (heavy metal) – it can become a vapor, mercury vapor that can linger in the atmosphere and travel halfway around the globe
- PCBs – polychlorinated biphenyls are chemicals used for industrial purposes, while banned, they are present in landfills and still pose a danger to the environment
- Perchlorate – key ingredient in rocket fuel and explosives, seeps into the ground water

Source: <https://www.globalhealingcenter.com/natural-health/12-toxins-in-your-drinking-water/>

Addendum: Water Bottles Containers

- 1: PET or PETE – used for single use bottles, can release heavy metals and chemicals that affect hormonal balance
- 2: HDP or HDPE (best and safest form of plastic)
- 3: PVC or 3V – releases two toxic chemicals that affect hormones in our bodies
- 4: LDPE – cannot be used for bottles, but can be used as plastic bags
- 5: PP – white or semi transparent plastic, used for packing syrups and yoghurt cups
- 6: PS – releases some carcinogenic substances, used in the production of coffee cups and fast food casings
- 7: PC or non-labeled plastic – dangerous form of plastic and releases PBA chemicals, used in production of sports water bottles and food containers

Source: <https://realarmacy.com/bottled-water-symbols>

Note: See next slide for symbols



PETE

HDPE



V

LDPE

PP











PS

OTHER

Examples of symbols
found on plastic
bottles

Addendum: Water Filter Bottles

 <p>Seychelle 20oz Extreme Water Filter Bottle</p> <p>☆☆☆☆☆ No reviews</p> <p>The new Seychelle 20oz. Extreme water filter bottle is ideal for any indoor or outdoor use. It re...</p> 	 <p>Seychelle 20oz Standard Water Filter Bottle</p> <p>☆☆☆☆☆ No reviews</p> <p>The new Seychelle 20oz water filter bottle with Seychelles standard filter removes up to 99.99% O...</p> 	 <p>Seychelle 24oz Pull Top Water Filter Bottle (Advanced)</p> <p>☆☆☆☆☆ No reviews</p> <p>Being able to drink fresh, filtered water anywhere without the need for water pressure or electri...</p> 	 <p>Seychelle 28oz Extreme Flip Top Water Filter Bottle</p> <p>☆☆☆☆☆ No reviews</p> <p>The bottle produces up to 100 gallons of great tasting water; Designed to remove: Gross Beta, Alp...</p> 
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Addendum: Water Filters using Reverse Osmosis



Aquacera NilusPRO
Premium Reverse
Osmosis Water Filter
System

☆☆☆☆☆ No
reviews

NilusPRO™ Premium
Reverse Osmosis System
incorporates our best
filtration technologies
with the l...



Crystal Quest
2000MP 16 Stage
Reverse Osmosis
System with Pump

☆☆☆☆☆ No
reviews

Water travels through 16
stages of filtration:
Comes with a pressure
pump In stage 1, Water
trave...



Crystal Quest
4000MP Reverse
Osmosis With Pump

☆☆☆☆☆ No
reviews

Water travels through 17
stages of filtration: In
stage 1, Water travels
through a 5 micron
solid...




Crystal Quest
Portable 10-stage
Reverse Osmosis
System

☆☆☆☆☆ No
reviews

Reverse osmosis
filtration is some of the
most effective available
today, capable of
removing eve...

Addendum: Water Filters using Reverse Osmosis



APEC Top Tier Alkaline Mineral pH+ 75 GPD 6-Stage Ultra Safe Reverse Osmosis Drinking Water Filter System (ESSENCE ROES-PH75)
by APEC Water Systems

\$229⁹⁵ ~~\$310.00~~ ✓prime
FREE Delivery by Fri, Dec 7


★★★★★ ▾ 733

Addendum: Water Filters Using Reverse Osmosis



Home Master TMHP-L Hydroperfection Loaded Undersink Reverse Osmosis Water Filter System

by Home Master

\$592⁹⁵ 

FREE Delivery by Thu, Dec 6

More Buying Choices

\$534.90 (7 used & new offers)


★★★★★ ▾ 264

Product Features

... Highly pure water with 9 stages of filtration, purification

Addendum: Water Filters Using Reverse Osmosis

APEC Top Tier Alkaline Mineral pH+ 75 GPD 6-Stage Ultra Safe Reverse Osmosis Drinking Water Filter System



APEC Top Tier Alkaline Mineral pH+ 75 GPD 6-Stage Ultra Safe Reverse Osmosis Drinking Water Filter System (ESSENCE ROES-PH75)
by APEC Water Systems

\$229⁹⁵ ~~\$310.00~~ ✓prime

FREE Delivery by Fri, Dec 7

★★★★★ ▾ 733

Addendum: Water Tester



Watts Premier 273001 Digital Water Purifier Tester

by Watts Premier

\$34⁶⁴ ~~\$39.95~~ ✓prime

FREE Delivery by Thu, Dec 6

Only 2 left in stock - order soon.

More Buying Choices

\$33.26 (2 new offers)

Conclusion

- It is always a good idea to test your water before deciding on the type of water filter that you need. This includes allergy testing that would impact on the water you drink as well as what you breath.
- As for what you breathe, be aware of the existence of mold as well as allergy reactions to environmental pollens, not to mention toxic chemicals that can dissolve into our atmosphere.
- As we become more aware of the toxins found in our water and air, there are equipment and filters that can clean up what is in the water and others that can clean up what is in the air.
- It is also helpful to be aware of the levels of oxygen in the atmosphere, especially in industrialized areas.
- Clean water and air are also essential for the health and wellbeing of our children and the next generation.

Note: Eating clean food, and checking out what is in your nutritional supplements and medications is also key to achieving wellness and optimum health.