

Drinking Water Treatment Technologies

The products on the market today utilize many different technologies. NSF currently evaluates residential water treatment products that utilize one of the technologies listed below. The applicable NSF/ANSI standard that applies to each technology is shown in parentheses.

Technology	Description of Product Technology
Filtration (NSF/ANSI 42 & 53)	This is the physical process that occurs when liquids, gases, dissolved or suspended matter adhere to the surface of, or in the pores of, an adsorbent medium. Carbon filters use this technology to filter water.
Softeners (NSF/ANSI 44)	Water softening devices covered by Standard 44 use a cation exchange resin, regenerated with sodium chloride or potassium chloride, to reduce the amount of hardness (calcium, magnesium) in the water. The hardness ions in the water are replaced with sodium or potassium ions.
Ultraviolet Treatment (NSF/ANSI 55)	This treatment style uses ultraviolet light to disinfect water (Class A systems) or to reduce the amount of heterotrophic bacteria present in the water (Class B systems).
Reverse Osmosis (NSF/ANSI 58)	A process that reverses, by the application of pressure, the flow of water in a natural process of osmosis so that water passes from a more concentrated solution to a more dilute solution through a semi-permeable membrane. Most reverse osmosis systems incorporate pre- and post-filters along with the membrane itself.
Distillers (NSF/ANSI 62)	These systems heat water to the boiling point and then collect the water vapor as it condenses, leaving many of the contaminants behind, particularly the heavy metals. Some contaminants that convert readily into gases, such as volatile organic chemicals, may be carried over with the water vapor.

Styles of Water Treatment Devices

There are several styles of water treatment devices available on the market today. The most common styles are listed below, along with a brief description of each.

Point-of-Entry (POE) System

These systems typically treat most of the water entering a residence. Point-of-entry systems, or whole-house systems, are usually installed after the water meter. (Water meters are usually located in the basement of a house. In warm weather climates, the water meter may be in the garage or outside of the house.) A water softener is an example of a POE system.

Point-of-Use (POU) System

These systems typically treat water in batches and deliver water to a single tap, such as a kitchen sink faucet or an auxiliary faucet mounted next to the kitchen sink. The following information contains a brief explanation of different POU systems and points to consider when determining which style of a system will best suit your needs. The list is ordered from easiest installation/operation to more difficult or complex installation/operation and should not be construed as any type of recommendation.

Particle (Contaminant) Size Chart in Microns

It proved to be quite a task to find a chart with accurate sizing of microns for the most common contaminants as well as common particles that are around us all the time (for comparison). This micron sizing chart is fairly complete. Hope this helps a little when it comes to understanding the size of these particles.

1 Micron = 1000 NanoMeters

Note the size range of viruses in this chart... .005 – 0.3

The .005 is much smaller than many water filters claim to remove! What is important to remember is the size of viruses that have proven to be harmful or deadly to humans. Smaller viruses exist according to scientists, but whether they are a risk to mankind or not, has yet to be determined -- it is also important to differentiate between water borne viruses and air borne (which can be much smaller).

Water Filters like the [Lifesaver Jerrycan](#) will filter out viruses to 0.015 microns (15 nanometers) in size, which includes all of the most common viruses found in water. Amazing technology when you think about it, a portable water filter that can remove such microscopic (and dangerous) particles from water.

PARTICLE	SIZE (in microns)
one inch	25400
Bacteria	0.3 - 60
Mold	3 - 12
Mold Spores	10 - 30
Viruses	0.005 - 0.3
Anthrax	1 - 5
Asbestos	0.7 - 90
Atmospheric Dust	0.001 - 40
Auto and Car Emission	1 - 150
Beach Sand	100 - 10000
Bromine	0.1 - 0.7
Burning Wood	0.2 - 3
Calcium Zinc Dust	0.7 - 20
Carbon Black Dust	0.2 - 10
Carbon Dioxide	0.00065
Cement Dust	3 - 100
Clay	0.1 - 50
Coal Dust	1 - 100
Coal Flue Gas	0.08 - 0.2
Coffee	5 - 400
Dust Mites	100 - 300
Fertilizer	10 - 1000
Insecticide Dusts	0.5 - 10
Lead	0.1 - 0.7
Lead Dust	2
Mist	70 - 350
Oil Smoke	0.03 - 1
Oxygen	0.0005
Paint Pigments	0.1 - 5
Pesticides & Herbicides	0.001
Pollens	10 - 1000
Radioactive Fallout	0.1 - 10
Red Blood Cells	5 - 10
Rosin Smoke	0.01 - 1
Sea Salt	0.035 - 0.5
Spanish Moss Pollen	150 - 750
Tobacco Smoke	0.01 - 4

