



Although water may appear to be clear, it always contains many microscopic particles, some of which can make water taste funny and even be dangerous to your health. There are many types of particles, and the tiniest sub-micron sized particles may number in the millions per milliliter of water.

Some of the more common particles that may be present in drinking water include cysts of parasites like Giardia and Cryptosporidium, asbestos fibres, bacteria, precipitates of heavy metals including lead, and “turbidity”, which refers to particles smaller than wavelengths of light, causing cloudiness.

### Cysts

Cysts are the infectious form of parasites that can cause sickness including cramps, vomiting and diarrhea. The most common cysts in water are Cryptosporidium and Giardia.

These parasites are encased in a leathery shell and incubate in the intestines for several days before causing sickness. In the last 10 years, there have been an increasing number of cryptosporidiosis outbreaks across North America. Cryptosporidium is especially dangerous to individuals with weakened immune systems, such as AIDS and cancer patients.

### Asbestos

Asbestos fibres enter water from the walls of the water-main piping that carries water from the municipality to your home or building. Asbestos was commonly used in the construction of water mains until recently. Asbestos also is naturally found in some types of rocks and therefore is often found in water supplies near mining operations.

### Bacteria

There are literally millions of different types of bacteria. While most types are harmless, some are dangerous. Bacteria are one-celled organisms and are present in everything from water to food and can be found on objects we touch every day.

Bacteria are the cause of some serious diseases, such as cholera, that plagued villages and towns centuries ago. Thanks to modern sanitation methods, many of these diseases have been greatly reduced or eliminated.

### Heavy Metals

High levels of cadmium, mercury and lead in drinking water can cause nerve damage, mental retardation, birth defects and cancer.

These occur in water as corrosion products, which are mostly particles of metal oxides or carbonates. Lead is especially dangerous to young children and pregnant women.

### Turbidity

Turbidity refers to the cloudy appearance of water by particles of suspended matter, such as clay, debris from plants, animals and biofilms and limescale. In addition to affecting the look and taste of water, particles can build up and eventually clog working parts of

water-using appliances such as ice makers and coffee makers. Often turbidity build-up can cause more trouble than limescale.

### **Adsorbed Materials**

Often small particles are attracted to larger particles in water, where they become permanently attached. This process is known as adsorption.

For example, adsorption causes viruses to stick to pieces of clay or rust, causes fully dissolved heavy metal ions to stick to floating asbestos fibres, and causes poorly dissolved clumps of chlorinated hydrocarbons such as PCBs and many insecticides to stick to specks of dirt suspended in water.

By removing the larger or host particle, the other particles are removed as well.

### **Removing Particles from Your Water**

POU systems designed for the consumer are typically the size of a household fire extinguisher. They are installed under the kitchen sink and dispense filtered water through a dedicated drinking water faucet.

It is important to look for a model that is certified by NSF International. NSF is an independent testing agency that sets product standards and certifies the performance of POU systems.

Look specifically for NSF Standard 42 for Particulate Reduction, Class I & Standard 53 for Turbidity Reduction.