



Chlorine is widely used by municipal water systems to disinfect water from bacteria, viruses and other microorganisms that cause diseases. In fact, approximately 75 percent of municipal water systems use chlorine. Diseases such as typhoid fever and cholera, which are easily spread through infected water, have virtually been wiped out because of chlorine use.

### **What is Chlorine?**

Chlorine is one of the chemical agents, noted for its great power as an oxidizing agent. When dispersed in the air, it was a terrible war gas. When dispersed in water, “free chlorine” attacks everything it touches, creating chemical by-products with every reaction.

### **Effects of Chlorine**

Despite its usefulness in disinfecting drinking water, there are problems associated with chlorine. Chlorine use can cause aesthetic water quality problems like a swimming pool taste and odour.

Far more alarming are some studies that link chlorine by-products with bladder, colon and rectal cancer. One study shows that people who drink chlorinated water run a 21 percent greater risk of bladder cancer than people who drink water with no chlorine.

One by-product is Trihalomethanes, or THMs. THMs are formed when chlorine reacts with naturally occurring organic matter in water, like decayed leaves. THMs (like chloroform) have been linked to a higher rate of cancer and have been classified as probable or possible human carcinogens by the US Environmental Agency

(EPA). Research also indicates that many other volatile organic chemicals (VOCs) are also often present in water that has been treated with chlorine.

### **History of chlorine and water treatment**

Chlorine was first used to disinfect water in the early 1900's. At the time, outbreaks of cholera and typhoid fever, spread by the water system, were common and severe. In fact, major North American cities were suffering 100 or more typhoid deaths per 100,000 persons. Within 10 years after chlorine was introduced, the death rate fell dramatically. Since then, chlorine has been a primary means of chemically treating water.

In the mid-1970's, research determined that VOCs, including chloroform and THMs, were present in drinking water that was treated with chlorine. Subsequent tests revealed that these compounds were not found in the same water prior to chlorine disinfection.

Consequently, in 1979 the EPA set a Maximum Contaminant Level (MCL) of 0.1 milligrams per litre (mg/l) for THMs. Recognizing the need to eliminate THMs from drinking water, the EPA has set a Maximum Contaminant Level Goal (MCLG) of zero for THMs. A MCLG is simply a target point though, not an enforceable limit. This standard applies only to water treatment systems serving more than 10,000 people, which covers 79 percent of the North American population.

### **Detecting chlorine in your water**

Determining whether chlorine is present is sometimes as simple as smelling or tasting your water. If your water smells or tastes like a swimming pool, the cause of that smell or odour is most likely chlorine. To be certain if chlorine is used in your water system, call your local health department or water provider.

## **Reducing chlorine in your water**

While there is no way to prevent the addition of chlorine in your municipal water supply, there is a way to remove or reduce chlorine and chlorine by-products from your water before you drink or cook with it. This can be done simply and cost effectively with a point-of-use (POU) water filtration system, certified by NSF International, for the reduction of chlorine, THMs and VOCs.

Typically the size of a fire extinguisher, POU systems designed for consumers are installed under the kitchen sink and the filtered water is served through a dedicated drinking water faucet.

As water travels through the POU system, sediment, particles, bacteria and harmful chemicals are removed by the system's main ingredient – activated carbon.

Activated carbon is an extremely porous material that attracts and holds harmful contaminants in the water through a process known as adsorption. The result is better tasting and cleaner water with fewer contaminants.

## **Peace of mind**

Remember to always look for filtration products that are NSF certified. NSF is a not-for-profit co. founded in 1944 to promote good sanitation. NSF maintains state-of-the-art laboratories where products can be tested according to the set standards. NSF standards are recognized around the world, including the International Standards Organization (ISO) and the Canadian Standards Association (CSA).