



ADVANCED WATER SYSTEMS GROUP

Proudly Presents

Frequently Asked Questions (FAQs) About Residential Water Quality

What are the Problems with Chlorine & Chloramines?

Chlorine is the most commonly used chemical for disinfection of municipal and community water supplies in the USA, which is required by Federal EPA regulations.

A very large number of residents in the Triangle area rely on source waters from surface reservoirs like Jordan and Falls Lakes, or else they are on community well water supplies, which are chlorinated.

Although the use of chlorine for disinfection has yielded incredible reductions in the risks associated with water-borne bacteria and disease over many years, and has undoubtedly saved many lives, it is not without its own set of problems, listed below.

RISKS OF CHLORINE

- Chlorine (Cl_2) is a poison gas
- Terrible chlorine smell
- Bad swimming pool taste
- Dries out skin
- Bleaches out hair color
- Ruins rubber seals
- Destroys toilet bowl flappers
- Reacts with natural organics to form Disinfection By-Products (DBPs)
- DBPs are absorbed through skin into bloodstream
- High concentrations lead to EPA violations.

The concentration of chlorine in municipal water supplies on any given day varies substantially. The range is from less than 0.1 PPM to greater than 2.0 PPM, which can exceed levels found in swimming pools.

The use of chlorine to protect your water is analogous to the plastic bag that you place your vegetables in on the way home from the grocery store. The bag is useful for protecting your produce, just like the chlorine protects

your water, but you will not eat the bag once you are ready to eat the produce. You will naturally discard it. This is exactly what should be done with the chlorine once it reaches your home in the water supply.

Probably the most significant dangers of chlorine are related to the disinfection by-products called trihalomethanes (THMs). These compounds are formed when free chlorine in the water reacts with naturally occurring organic material in the water. Natural organics are common in surface reservoirs and in wells. Trihalomethanes are comprised of four major compounds, listed below:

- Chloroform (CHCl_3)
- Bromodichloromethane (CHCl_2Br)
- Dibromochloromethane (CHClBr_2)
- Bromoform (CHBr_3)

THMs are a public health concern because of their link to cancers. There have been numerous studies linking THM concentrations to serious reproductive health problems such as spontaneous abortion, birth defects, low birth weight, and intrauterine growth retardation. The EPA sets a limit of **80 PPB (parts per billion)** of Total Trihalomethanes (TTHMs) in drinking water.

Many studies have shown that DBPs are rapidly absorbed through your skin directly into your bloodstream without being metabolized by the body, sometimes up to 10x faster.

To minimize the levels of THMs, many communities use alternative disinfecting chemicals known as chloramines. Chloramines are compounds formed by mixing chlorine and ammonia. The common chloramines are shown below:

- monochloramine (NH_2Cl)
- dichloramine (NHCl_2)
- nitrogen trichloride (NCl_3)



ADVANCED WATER SYSTEMS GROUP

Your Local Authorized, Independent Kinetico Dealer Proudly Serving in 77 Counties in 4 States!

WWW.KINETICORICHMOND.COM

What are the Problems with Chlorine & Chloramines?

These compounds tend to be more stable than chlorine, remaining in the water for a longer period, and do not form THMs as quickly as chlorine. The use of chloramines is usually done in combination with chlorine and in many instances both types of chlorine are present in the water. While the use of chloramines may reduce THM formation, the health effects of the chlorine-ammonia mixtures are yet unknown.

In addition, chloramines have been linked to serious dezincification reactions in some brass plumbing systems, especially where hot water recirculation systems are used. The dezincification process is where zinc is selectively leached out of the brass alloy of plumbing fittings leading to corrosion, loss of metal integrity, and leaks. This ultimately leads to fitting failure. Chloramine disinfection is currently being practiced in Raleigh, Durham, Chapel Hill and Chatham County.

Treatment for Chlorine & Chloramines

The best way to reduce these chemicals and their byproducts is by using granulated activated carbon (GAC). Besides chlorine compounds, GAC also significantly reduces THMs and a range of other volatile organics (VOCs) that are toxic or can lead to foul tasting or smelling water.

Activated carbon is available from a variety of sources, including bituminous coal and coconut shells and comes as a loose granulated media. GAC filter beds are used to remove a wide range of chemicals at the whole house level. For chloramine removal, a special type of GAC, called Catalytic GAC is recommended. Catalytic carbon is much more effective at reducing chloramines from the supply. One such brand of this carbon is called Centaur from Calgon. Whole house carbon filters come in two type, static tanks and backwashing filter systems.

Kinetico offers the non-electric **DC1100 Dechlorinator**, which is a large, 10" x 54" single tank system that uses a coconut-shell derived granulated active carbon (GAC) media bed to adsorb the chlorine and THMs from the water, as well as other VOCs.

For chloramine reduction Kinetico offers the **CRS1100 Chloramine Reduction System** with catalytic GAC for effective reduction of chloramines, as well as chlorine and other VOCs.

In these systems, once the carbon beds are saturated with contaminants, they must be re-bedded with new carbon. The carbon may last up to 2-3 years, or more depending on influent chlorine levels and water use.

The **Kinetico Mach 2100fOD** backwashing filter bedded with GAC or catalytic carbon is a more robust system and offers distinct advantages over other types of filtration systems. For one thing, they are designed similarly to their innovative softener systems. That is, they are non-electric, twin-tank (10" x 54"), on-demand systems. When the system is charged system with GAC it is a very effective carbon filter system for removing chlorine, chloramines and the disinfection byproducts.

With the **Kinetico Mach 2100fOD** system the life of the carbon is somewhat longer because the system backwashes periodically using filtered, chlorine-free water to turn over the bed to expose new carbon surface area. The saturation of the beds is generally 3-5 years, or longer depending on water use. Eventually the carbon beds in the backwashing system also have to be renewed.

Kinetico has also extended its **Combination System** design to include the GAC system as well, called the **Mach 4060sOD-AC** system. It combines GAC filter beds with a Kinetico softener for clean, soft, chlorine-free water. Both the **4060sOD** and **2100fOD** systems accomplish their backwashing and regeneration cycles using only clean, chlorine-free, soft water (for the **4060sOD**). For chloramine removal, the **Mach 2100fOD** system is better due to the larger beds (more carbon).

Call Today for a **FREE On-Site Water Test**

1-877-609-2837