



# TRIANGULAR WAVE Fact Sheet

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## Why Triangular Wave Technologies Inc. Water Filtration Systems Are “State-of-the-Art”

Patented KDF process media and patented air entrainment systems make the difference. Triangular Wave Water Treatment Systems use either the patented KDF process media alone, or the KDF process media in combination with granular activated carbon (GAC) and other filters.

KDF media remove up to 99% of the chlorine in municipal water. By removing the chlorine, the life of the GAC is extended up to 10 times. Furthermore, the KDF media protects the GAC bed against fouling from bacterial growth. At the same time the KDF media **remove up to 98% of the lead and other heavy metals that are of growing concern to public health officials.**

### How the KDF Media Work

In plain English, the KDF media simply exchange electrons with the contaminant's. The give and take of electrons changes many contaminant's into harmless components, such as chlorine to chloride. Other contaminant's, such as lead and other heavy metals, bond to the KDF media.

The patented KDF process media are high-purity copper-zinc alloy formulations. They reduce contaminants in water using oxidation/reduction (redox)—the electro-chemical potential of purified dissimilar metals.

### How TWT Filtration Systems Remove Chlorine From Water

The TWT Systems utilize KDF 55 process media. The removal of chlorine using the KDF process media is a simple chemical reaction. When the chlorine comes into contact with the copper/ zinc alloy, the zinc loses 2 electrons (oxidation), and the chlorine gains 2 electrons (reduction). The chlorine becomes harmless chloride ions that stay in solution.

KDF 55 process media has been specially formulated to remove chlorine from water in point-of-entry water treatment systems.

### How TWT Filtration Systems Remove Iron From Water

The goal of any iron removal system is to oxidize ferrous iron to the insoluble ferric form; so it can be filtered from the solution. The Triangular Wave System uses a three step process to remove iron from the water.

- **Air entrainment**
- **A three step conversion of soluble ferrous cations. to insoluble ferric hydroxide.**
- **Filtering of the ferric hydroxide.**

The exact rate of ferrous iron oxidation depends on the concentration of ferrous cations, concentration of dissolved oxygen, pH and temperature. To increase the dissolved oxygen levels, air can be introduced via an air injector and mixer. If enough oxygen is dissolved in the water, 98% or greater iron removal efficiency is assured. The TWT Filtration Systems uses the MaxMixer Air Injector

to entrain air into the water. Then the patented MaxMixer greatly reduces the size of the air bubbles to allow greater reaction with the ferrous iron cations. The oxygen from the air entrainment and the ferrous iron cations react to convert soluble ferrous iron cations to insoluble ferric hydroxide. The ferric hydroxide is filtered by the TWT Filtration Systems neutral filter aggregate. Regular back washing removes accumulated ferric hydroxide from the neutral filter aggregate. In situations with particularly high concentrations of iron in the water, KDF 85 process media are added to the enhanced TWT Iron Removal Filtration System to help the air entrainment / filter process. The KDF 85 process media has been specially formulated to remove iron from water in point-of-entry water treatment systems. KDF 85 redox process media are propriety copper and zinc alloys that function as a catalyst to change soluble ferrous cations to insoluble ferric hydroxide. The KDF alloy process medium is not consumed and does not require regeneration.

### How TWT Filtration Systems Control Microorganisms

KDF process media control microorganisms in two ways:

- **The first way is a by-product of the redox reaction. The exchange of electrons actually sets up an electrolytic field that most microorganisms can not survive.**
- **The second way is the redox process causes hydroxyl radicals and peroxides to form from some of the water molecules. The hydroxyl radicals and peroxides interfere with the microorganisms ability to function.**

### How TWT Filtration Systems Remove Hydrogen Sulfide

Hydrogen sulfide gas (H<sub>2</sub>S) and its characteristic “rotten eggs” smell is common in many groundwater supplies. It can be removed by entraining air into the water to release the dissolved hydrogen sulfide gas. The gas is then vented to the outside of the structure.

In situations with particularly high concentrations of hydrogen sulfide in the water, KDF 85 process media are added to the Triangular Wave Iron/Hydrogen Sulfide Removal System to help the air entrainment/venting process. The KDF 85 process media has been specially formulated to remove hydrogen sulfide from water in point-of-entry water treatment systems.

### How the Triangular Wave Systems Control Scale, Lime and Biological Deposits.

Scale and biological deposits form when these elements “stick” to the surfaces of pipes, water heaters, plumbing fixtures and other equipment. The Triangular Wave “deposit control system” charges the particles in the water so that they cannot stick together or stick to any surfaces. Once charged, scale and biological deposits will simply pass through the pipes and into drains. For even more comprehensive protection, the TWT Deposit Control Systems can be used in conjunction with the filtration media previously discussed. Triangular Wave System is used in conjunction with media previously discussed.