**_WATER GUARD, INC_**
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# TECHNICAL BULLETIN ~ *FERRO-QUEST*

WATER GUARD'S FERRO-QUEST is a product specifically formulated to prevent "red or black water" caused by iron and manganese in potable water systems. It is a unique blend of poly phosphates that chemically combine with metal ions to form soluble complexes. A water-white liquid with a specific gravity of 1.41 and a pH of 10.2, Ferro-Quest has 38% polyphosphate as PO4.

FERRO-QUEST is stable in the presence of chlorine in concentrations normally found in drinking water. There are no interactions between chlorine and FERRO-QUEST that reduce the level of effectiveness of either chemical. Iron, manganese, and other heavy metal ions are known to contribute significantly to the instability of liquid chlorine but when bound by a chelate such as FERRO-QUEST, chlorine decomposition is significantly reduced. Iron and manganese sequestered by FERRO-QUEST as colorless complexes before chlorination will remain colorless after chlorination.

## REGISTRATIONS

### National Sanitation Foundation

Water Guard's FERRO-QUEST is NSF/ANSI 60 certified for use in drinking water for corrosion and scale control purposes. Its maximum use level should not exceed 39.6 mg/L

## BENEFITS OF FERRO-QUEST IN A WATER SYSTEM

- Reduces stains, discoloration or rusty water caused by oxidized iron and manganese
- Inhibits formation of calcium and magnesium carbonate scale from water system supplies
- Holds scale causing minerals in solution by tying up soluble metals in the water system
- Removes existing scale and tuberculation in water system to increase flow rate
- Increases water quality
- Lowers chlorine demand and consumption

## INITIAL SYSTEM TREATMENT

The water distribution system must be satisfied before the sequestering of the incoming water can be effective. The initial dosage is the maintenance dosage plus either an additional dosage of 5 ppm or an amount equal to the calculated maintenance dosage, whichever is greater. This elevated rate should be injected for two or three months or until visible "red water" is gone. The elevated amount of FERRO-QUEST used during this period will remove build-up in the system and re-dissolve any deposited iron or manganese.

Because residue will begin to break off in the system, the water quality will initially be lowered. To assist this cleaning, the system lines should be blown by opening blow-off valves to get maximum flow. This procedure should be fone on a systematic basis to make sure all lines are cleaned. Special attention should be given to dead end lines and lines that normally have low flow. Once this procedure results in clear water, the application rate can be decreased to the calculated maintenance feed rate. In cases of severe iron or manganese, the system should be cleaned by super-chlorinating before the initial treatment of FERRO-QUEST.

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## INJECTION AND FEED RATE PROCEDURE

Since chlorination accelerates the formation of insoluble iron and manganese, FERRO-QUEST should be added to the water before chlorination. It is injected into the water system by use of a chemical metering pump. FERRO-QUEST is is a concentrated formula but with proper sizing of the chemical pump, the material can be injected into the water system directly from the shipping or storage container. To feed smaller amounts of FERRO-QUEST, dilute the concentrated mixture with water in a chemical mixing tank.

FERRO-QUEST is capable of sequestering up to 15 ppm of iron, but is recommended that iron removal methods be used if iron is found to be greater than 2 ppm. FERRO-QUEST can also be beneficial when used immediately after an iron removal filter to sequester any small amounts of iron that may bypass the removal system itself.

FERRO-QUEST should be added as far upstream from the chlorine injection point as possible. The use of several bends in the pipe or use of a mixing chamber is preferred to maximize mixing. This will five FERRO-QUEST time to contact the iron and manganese and react to form soluble complexes.

The feed rate is determined by the concentration of the iron and manganese. Observe the following calculations for use to determine how much FERRO-QUEST should be added to a give water system.

## CALCULATIONS FOR USE

**MAINTENANCE DOSE**

**IRON CONTROL**

Add 3 ppm of FERRO-QUEST for each 1 ppm of iron present.

*Equivalent to 0.23 gallons (29 ounces) of FERRO-QUEST per 120,000 gallons of system water.*

**MAINTENANCE DOSE**

**MANGANESE CONTROL**

Add 6 ppm of FERRO-QUEST for each 1 ppm of manganese present.

*Equivalent to 0.45 gallons (58 ounces of FERRO-QUEST per 120,000 gallons of system water.*

- ***For water systems that include both iron and manganese, the amount of FERRO-QUEST needed is sum of both the above calculations.***

## STORAGE AND HANDLING

FERRO-QUEST is stable for up to two years. All polyphosphates tend to change to ORTHO state over time, so Water Guard recommends the smallest quantity needed to adequately treat the water system for a three month period to avoid long term storage of the product. Orthophosphates are less effective in sequestering metal ions. The product is available in one gallon cases, 5 and 15 gallon containers, 55 gallon drums and mini-bulk quantities.