

# Crusader Phosphate Technology Bulletin

Phosphates are among the few recognized substances that can be safely added to potable water to solve a variety of water-related problems.

Among many other benefits, the use of phosphate has proven to be an effective method for controlling corrosion, discolored water and calcium scale build-up in plumbing systems. Unhealthy levels of lead and copper in water can also be reduced to comply with the United States EPA Lead and Copper Rule.

Phosphate-treated potable water supplies will help control problems in every type of plumbing system including galvanized, copper, iron, cement, asbestos and plastics like PVC, CPVC, Polypropylene, Polyethylene, and PEX.

Over 200 formulated phosphate-based products are now certified with the NSF for use in potable water treatment. In general, phosphate technology can be grouped into the following categories:

- **ORTHOPHOSPHATES**
- **ZINC ORTHOPHOSPHATES**
- **ZINC POLYPHOSPHATES**
- **ORTHO POLYPHOSPHATE BLENDS**
- **LINEAR CHAIN POLYPHOSPHATES**
- **SILICA-PHOSPHATE BLENDS**

**ORTHOPHOSPHATES** and many **ZINC ORTHO-PHOSPHATES** are primarily used in low hardness waters where corrosion control and reduction in lead and copper solubility are the primary focus of treatment. Ortho-phosphates have no sequestering abilities.

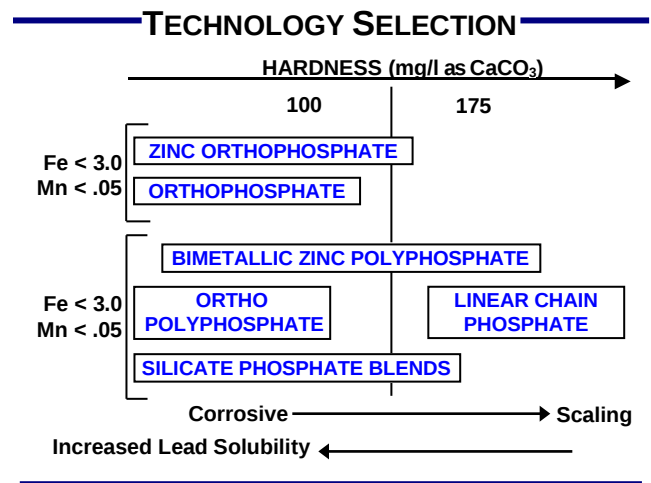
**ZINC POLYPHOSPHATES** offer a combination of corrosion inhibition and sequestration. They find application in systems where corrosion control is an issue, but elevated levels of iron and manganese in the finished water produce color and staining problems.

**ORTHO POLYPHOSPHATE BLENDS** can be formulated for use over a broad range of water qualities. Ortho polyphosphate blends can be used for both corrosion inhibition and sequestration.

**LINEAR CHAIN POLYPHOSPHATES** are used almost exclusively in hard water supplies for sequestering

scale and discolored water. The amount of polyphosphate contained, as well as the type of phosphate, is formulated according to the quality of the water.

**SILICA-PHOSPHATE BLENDS** were developed to enhance the sequestering action of basic silicates. They function essentially as straight silicates for lead and copper control.



Each of these technologies has been used in the United States for many decades. Many water municipalities use phosphates to treat their own distribution systems.

Before initiating a water treatment program, consult with your local Clean Water Crusader who is experienced with phosphate and silicate treatment in potable water supplies. Water quality factors and plumbing characteristics must be thoroughly analyzed to design the very best water treatment program.

A properly selected phosphate technology will help control corrosion, discolored water and calcium scale in all types of plumbing systems. Lead and copper residuals can also be reduced.



# SAFETY AND HEALTH INFORMATION

## What are Phosphates?

Phosphate compounds are Food and Drug Administration (FDA) approved and safely used every day as an additive in many of your favorite foods and drinks. Different blends of approved food-grade ortho and poly phosphates have proven to be effective in controlling corrosion, discolored water and calcium scale build-up in plumbing systems. Unhealthy levels of lead and copper can also be reduced.

Phosphate is a derivative of phosphorus, a mineral required in the food supply for all plants, animals and humans. Phosphorus is necessary for building strong bones and teeth. It is also needed for healthy nerves and for efficient mental activity. Phosphorus is an essential nutrient. The recommended daily allowance (RDA) for adults is 800 mg. The RDA for children or women during pregnancy or lactation is 1,000 – 1,400 mg.

## What types of food and beverages contain phosphates?

Phosphorus is naturally found in whole grains, seeds, nuts, legumes, dairy products, egg yolks, fish, dried fruits and corn. The food industry commonly adds phosphates to soft drinks, pasteurized cheeses and prepared cereals. Phosphates are also added to ham, bacon, turkey products, cakes, muffins and donuts. Phosphates make up about 25% of the total ingredients in toothpaste.

## Are phosphates safe?

The FDA, National Sanitation Foundation (NSF), and the Center for Science in the Public Interest list phosphates as *safe*.

## Do water utilities use phosphates?

Yes, approximately 50% of water utilities nationwide safely use phosphates to control internal pipe corrosion. Many water utilities have been safely using phosphates since the passage of the Environmental Protection Agency's (EPA) Lead and Copper Rule (1992) to reduce lead and copper levels in tap water.

## How much phosphate will be added during the water treatment process?

Research indicates that people usually consume 1,000 –1,500 mg of phosphate per day in their diet. A Crusader filter usually adds a level of 0.5 - 2 mg/l of phosphate to the potable water supply, increasing the average daily intake by as little as 0.1 – 0.2 %.

