



Public Utilities

Fluoride Usage in Water Treatment

What is Fluoride

- Fluoride, a mineral, is naturally present in water, soil, many foods, other sources and is available as a dietary supplement. Fluoride is the ionic form of the element fluorine, and it inhibits or reverses the initiation and progression of dental caries (tooth decay) and stimulates new bone formation [1].
- Soil, water, plants, and foods contain trace amounts of fluoride. Most of the fluoride that people consume comes from fluoridated water, foods and beverages prepared with fluoridated water, and toothpaste and other dental products containing fluoride [2,3].

Benefits

Water fluoridation is the best method for delivering fluoride to all members of the community, regardless of age, education, income level or access to routine dental care. Fluoride's effectiveness in preventing tooth decay extends throughout one's life, resulting in fewer — and less severe — cavities. In fact, each generation born over the past 70 years has enjoyed better dental health than the one before it.

- Historically the range of 0.7 to 1.25mg/L was maintained to reduce the prevalence and incidence of dental cavities in primary and permanent teeth and was low enough not to cause dental fluorosis.
- In recognition of the impact that water fluoridation has had on the oral and general health of the public, in 1999, the Centers for Disease Control and Prevention (CDC) named fluoridation of drinking water as one of ten great public health achievements of the 20th century.

Drawbacks

Hydrofluorosilicic Acid is very acidic chemical with a pH in the 1.2 to 2.0 SU range. All chemical safety practices must be strictly enforced to skin and eye contact.

Prior to working with Hydrofluorosilicic Acid all employees are required to be trained on its proper handling and storage.

- Dental fluorosis is a change in the appearance of the tooth enamel that only occurs when younger children consume too much fluoride, from all sources, over long periods when teeth are developing under the gums.
- In 2015, the U.S. Department of Health and Human Services (HHS), using the best available science, established the recommended concentration for fluoride in the water in the United States at 0.7mg/L.¹⁷ This level effectively reduces tooth decay while minimizing dental fluorosis.

Usage and Cost

MPWTP adds Hydrofluorosilicic acid (HFS) to maintain a 0.7mg/L fluoride residual in or drinking water. This residual is below all limits set by the EPA.

- The U.S. Public Health Service (USPHS) updated its 1962 Drinking Water Standards related to community water fluoridation to establish a single value of 0.7 mg/L as the optimal concentration of fluoride in drinking water.
- This concentration provides the best balance of protection from tooth decay while limiting the risk of dental fluorosis.¹

MPWTP Budgets approximately \$29,000 per year for fluoride costs.

- Receiving approximately two (2) semi-truck loads of Hydrofluorosilicic acid (HFS) per fiscal year.
- With a chemical weight of 45,000 pounds each.
- Current cost of \$0.31 per pound.