

Podcast Title: It's Your Water

Episode Title: Understanding pH

In this episode of *It's Your Water*, Michael Urbans and Justin Mest of Master Water Conditioning, share their expertise on pH and treatment methods for correction of low pH water. Together they discuss the topics of pH, corrosion and alkalinity, and the importance of proper testing; the pros and cons of treatment using calcite (calcium carbonate) and soda ash (sodium carbonate) in well water applications; high pH and alkaline water.

Mike and Justin discuss the definition of pH and its relationship to the lead corrosion problem which occurred in Flint Michigan. pH is intimately related to corrosion but two separate topics.

The practical and safest means of increasing pH include installation of a neutralizer, which is a system with calcite, or a chemical feed pump with soda ash. Although sodium hydroxide will also increase pH it is dangerous to use in a residential setting because sodium hydroxide itself is a hazardous substance, and there is little room for application error. It is generally used in the industry, but most commonly to treat a community water system, allowing requiring operation and maintenance by certified companies and individuals.

Prior to treating pH, test the water for total hardness iron, pH, total dissolved solids (TDS) and total alkalinity or free carbon dioxide. Color indicator tests are not accurate at high pH or low pH and at high total alkalinities and low total alkalinities. Proper sizing of the treatment equipment is based on the test, the number of bathrooms and the well pump flow rate.

Considerations when sizing a calcite neutralizer

- Calculate peak demand. If your well pump only produces 5 gpm and your demand is 10 gpm the application will require 2 tanks instead of one tank.
- Contact time with the calcite is critical. pH at the sink may be 7.2 but what is the pH when laundry and 2 people are taking showers?
- It is necessary to backwash a calcite neutralizer. Make sure the well pump is powerful enough to lift the media. Otherwise calcite will become like concrete.
- Magnesium oxide can be added to the calcite to adjust for lower pH.

Using chemical injection of soda ash

- This is less convenient for homeowners unless they hire a water treatment company to maintain the chemical feed system.
- Soda Ash (powdered sodium carbonate) is mixed with warm, preferably soft, water.
- A chemical feed system injects the soda ash liquid.
- Soda ash chemical feed systems allow you to "dial in" to a specific pH.
- Soda ash is a powder which will irritate mucus membranes and irritate lungs.

- Unless it is mixed properly soda ash will precipitate out into chunks and become a sludge in the storage tank.

Alkaline, high pH water has become a popular drink. A WQA (Water Quality Association) task force was created to determine whether they should take an industry position on “alkaline water”. There is not enough science, specifically repeatability of results and follow-up studies. Accordingly, WQA has not taken a stance with regards to alkaline drinking water. The decision to drink alkaline water should be made by the individual and their physician.

#### Key Takeaways:

- Preventing corrosion is not as simple as increasing pH.
- Using sodium hydroxide is not recommended for pH adjustment due to the dangers of dealing with this chemical.
- Prior to treating it is imperative to test the water and advise number of bathrooms and well pump flow rate.
- Sizing of calcite neutralizers can be tricky. There is no “one size fits all”.
- Homeowners like calcite neutralizers because they are easier to maintain than chemical feed systems.
- Chemical Feed Systems with soda ash require more attention but are more reliable than calcite neutralizers, when maintained properly.
- Soda ash is not as dangerous to handle but when handled improperly it will irritate mucous membranes and lungs.
- Homeowners should consider hiring an experienced plumber, well driller or water treatment dealer to maintain a chemical feed system.
- There may be benefits to drinking alkaline water but there is not enough scientific evidence to definitively state what they are. It is a personal decision and should be made in consultation with a physician.

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