

AQUA SOFT II

**Electronic Water Treatment System with patented
High Frequency Alternating Electric Field Technology**

Operation Principle & Effects

1 Operation Principle

Aqua Soft II generates, through its patented antenna, a high frequency alternating electric field directly into the target pipe that is applied. The intensity of the field produced is controlled by its patented control module.

The produced alternating electric field is capable of giving the water's charged ions the necessary kinetic energy to make them collide and form neutrally charged insoluble crystals. This process is called controlled precipitation. When the crystal size reaches the size of 1 to 1,5 microns the crystal become neutrally charged. The formed crystals remain insoluble even after traveling long distances inside the pipe (or storage container) for a period of up to 6 months, depending on the storage conditions.

The formed crystal structure consists mostly of Calcium Carbonate and include other ions contained in the water like silicate manganese etc.

2 Effects

The above-mentioned effect from Aqua Soft II has some very important effects in the water's "behavior".

2.1 Protection from scaling

The processed water has significant reduced levels of oversaturation causing the water to stop forming scales. The scale-responsible ions will remain bound in neutral change crystals flowing through in suspension.

2.2 Existing scale removal in the pipe network

The crystal forming process releases small quantities of **carbonate dioxide** that remains in the form of microbubbles and partially forming carbonic acid.

The treated water gains the ability to be more penetrating, due to its change in viscosity (see below) making it able to fill up smaller pores and with the help of the carbonate dioxide gradually dissolves formed scales until they are removed completely. The time needed to clean is depended to various factors like the amount of scale formed the length of the network as well as the daily flow.

2.3 Anti-corrosion Protection

Along with the crystallization effect, Aqua Soft II also raises the chemical potential of oxygen in the water, making it able to react with the formed iron oxides (rust) and copper and convert them to magnetite (iron (II, III) oxide) and copper oxide respectively. These oxides formed have no electric charge, thus making them protected to electrochemical corrosion.

Additionally, it neutralizes the electric charge of ions thus preventing water to act as an electrolytic solution.

2.4 Physical characteristic enhancement

The field generated from Aqua Soft II also weakens the hydrogen bonds in the water molecules resulting to a lower viscosity and surface tension. Thus, the treated water has a significantly reduced boiling point.

2.5 Enhanced Solubility

Due to the affirmations crystallization process, the treated water shows a “quasi-deionized” behavior resulting to significant increase to its dilution capacity of chemicals and detergents, something that would be otherwise impossible due to saturation and oversaturation effects.

This effect results in **the use of significantly less amounts of detergents** for all uses.

2.6 Anti-microbial Action

Aqua Soft II offers antimicrobial action due to two simultaneous different effects. Firstly due to “quasi-deionized” behavior the water is considered hypotonic that leads water molecules entering the bacterial membrane due to osmotic phenomenon causing it to burst. This effect is called **cytolysis** (osmotic lysis).

Simultaneously, carbon dioxide microbubbles have also a biocidal effect especially in closed spaces like piping, boilers etc.

The amount and efficiency of these actions are part of a clinical study and testing with its results expected to be published in the first quarter of 2020