The Scalewatcher Process

Scalewatcher is a unique, efficient, energy-saving device designed to eliminate the problems of hard water, whilst retaining the natural benefits. This is achieved by changing the properties of the particles of precipitated compounds, by aiding the ability of crystals to form their shape, and by altering the solubility of compounds within liquid.

This is achieved by promoting crystal growth in the bulk of the water, rather than on surfaces like pipe walls, shower heads or heat exchangers. These crystals flow with the water, have less or no surface charge and will therefore not adhere to other surfaces. They go down the drain.

Scalewatcher takes the process of induced ionisation to its ultimate stage. The principles of Magnetohydrodynamics (MHD) are applied by passing Scalewatcher's signal through a coil wrapped around the pipe to be treated. The signal consists of a frequency modulated (FM) within the audio frequency (AF) bandwidth. This inaudible sonic frequency signal sets up a dynamic field around and through the coil, pipe and water, and modifies the calcium carbonate crystal nuclei.

The frequency modulated signal induces electric and magnetic fields around and inside the coil (reating the water flowing through the pipe). The frequencies used are all within the audible band but are inaudible as electric and magnetic fields cannot be heard. All water has impurities (small negative charged particles) which can be used as a starting site for crystal growth. Growth being made possible by the presence of dissolved mineral ions AND the treatment by Scalewatcher. The more crystals are formed, the less dissolved free mineral ions are in the water, the less hard scale is formed on surfaces.

The nuclei upon which the crystals start growing are minute in size and have charged surfaces in their natural condition within the water. When they pass through the field, these naturally charged nuclei encounter considerable forces as the field interacts with them. The field acts at the surfaces of the nuclei and modifies the nature of the electrical charges and this ionisation effect thus alters the growth rate and pattern of the crystals in general and on specific planes.

Scale Reduction

It is this changed size, modified charge and crystalline shape that has the first two beneficial properties for the reduction of scale.

Hard scale is caused by dissolved minerals in the water. (The positive and negative ions like Calcium and Bicarbonate). The Scalewatcher treatment reduces the number of these ions as a large number are used to form crystals in the bulk of the water.

1. The 2-4 micron nano sized crystals become non-sticky and will not coagulate or precipitate and form scale in the same way as untreated calcium carbonate nuclei dissolved minerals would.

2. The nano sized crystals in the bulk of the water have a mass, (weight), larger then the dissolved mineral ions and will therefore sink to the bottom of a tank, boiler or coffeemaker

when the water is not flowing. Because of their size the sediment will be soft and easy to remove.

3. The presence of the large crystalline shapes disrupts the equilibrium between the fluid and any existing scale. Smaller particles in general, dissolve more easily, so the larger particles will have reduced the levels of calcite Calcium Carbonate in solution. Hence, existing scale deposited by precipitation will soften and gradually be absorbed into solution and flow out of the system. In areas of still water, e.g. tanks etc., crystals would settle to the bottom and could then be removed simply by flushing.

It has been established that the physiochemical process already described is more efficient because the signal energy is dynamically changing. frequency of the signal is continuously changing within a band unique to Scalewatcher.By changing the signal field at high audio frequencies, unique to Scalewatcher, the energy imparted to the nuclei is considerably accelerated. The crystal intra molecular structure is rapidly broken down and the occurrence causes a fast dissolution of any existing scale forming molecules.

Over time the promoted growth of Calcium Carbonate crystals in the bulk of the water will dissolve back into the water. An important property of Scalewatcher processed water is that the charged crystalline shape growth crystals in the bulk of the water will remain in that state for up to 7 days depending on temperature and other parameters. Thus in stored water systems the effect is much longer lasting than other ionisation physical water treatment methods. retarding the reversion back (the dissolving back of the Calcium Carbonate crystals in the bulk of the water) to the smaller nuclei structures having more dissolved minerals in the water that are readily precipitated.

Potability and Water Quality

The calcium carbonate remains in the water as soft crystals, not as hard scale therefore water treated with Scalewatcher should reduce the risk of Gallstones. Minerals which have now been taken out of solution and crystalised to a size greater than 1 micron could, if desirable, be reduced using a good quality on micron ceramic or stainless steel filter.I would take this out. Better to mention that the crystals formed are non hazardous when drinking the water as the acidity of the stomach will dissolve them back into solution.

The sodium content and degree of acidity (PH) remain unchanged. The generation of carbon dioxide invigorates the water but is not enough to cause bubbles.

If calcium sulphate, which causes scum as opposed to scale, if present it will also undergo a change. This increases the effectiveness of soap/detergents.