

The Technology of HydroFlow

HydroFlow is the US Master Distributor of the Hydropath technology & *New Water Innovations* is the distributor for the HydroFlow products in New Mexico and Arizona.

HydroFlow is the solution for:

- Limescale
- Bacteria
- Algae elimination
- Filtration enhancement
- Corrosion reduction

The system consists of a power supply with a transducer that works much like a transformer and ferrites. The transducer has a primary coil and a secondary coil with ferrites that go around the pipe. The transducer is secured to the pipe by straps. In the smaller application, the ferrites are enclosed in the unit. The ferrites surround the pipe inducing a 150 KHz sine wave that propagates a decaying signal into the pipe. This wave is moving constantly whether the water is running or not. The HydroFlow system is 30,000 times more effective than any physical conditioner on the market today. The energy used is less than 100 milliamps (less than a 20 watt light bulb).

Scale is formed when Calcium and bicarbonate are dissolved in water. Water becomes super-saturated when there is a temperature increase or pressure decrease. When this occurs, the ions precipitate as calcium carbonate (limescale) and crystallize to form scale. The HydroFlow signal is propagating through the pipe charging the negative and positive ions. This process makes them cluster. These clusters form seed crystals. The crystals prefer to attach themselves to the existing crystals rather than the pipe or heating elements. The crystals are less than 10 microns (Hair is 80-100 microns).

A by-product of this process is the creation of Co₂ into the water. The carbon dioxide dissolves the existing scale. In order for the Co₂ to dissolve the scale in the system, the water needs to be hard. (You cannot continue to use a softener with the HydroFlow.) We tell clients that it will take time to clean out pipes that have years of scale. It would be wise after time to clean out aerators, shower heads and flush the water heater.

In the water the *bacteria* is also charged and forms a pure *wetting layer* around the bacteria. The bacterium is looking for nutrients from the water to grow. Osmosis forces water into the bacterium and causes it to burst within seconds.

In order for the bacteria to be killed, it must pass the ferrites. HydroFlow will eliminate 99.99% of bacteria and algae passing through the unit.

High Frequency Water Conditioning Technology

Background

HydroFLOW USA exclusively distributes *HydroFLOW* products which are manufactured by Hydropath Holdings Limited of England and powered by the patented and eco-friendly Hydropath Technology.

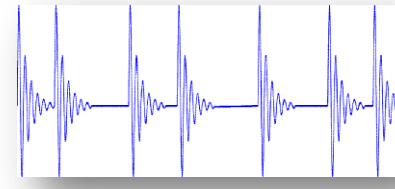
Over 20 years ago, the largest residential gas provider in the UK, British Gas, was looking for a chemical-free water conditioning device to protect their customers' residential water heaters. The company knew water conditioning using magnets, electromagnets and coils have been around for many years but their effectiveness in reducing scale accumulation is very limited.

British Gas challenged inventors to patent a water conditioning technology that was effective in preventing lime scale accumulation. The chosen technology was Hydropath [The British Gas report from 1992 is available upon request]. To this day, British Gas purchases roughly 30,000 residential units per year, which are mounted as an OEM on every water heater they install. After many years of intense international research, Hydropath Technology has evolved into a world-leading technology which provides chemical-free solutions to a diverse range of industries.

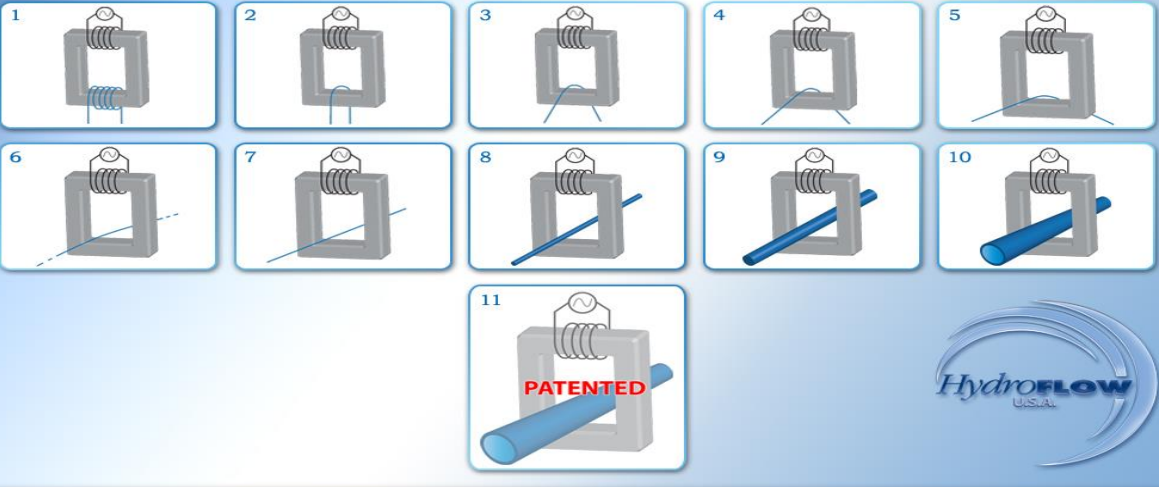
Technical Overview

HydroFLOW water conditioners induce a decaying sine oscillation of ± 150 kHz into the water system in a similar way to how a transformer works.

- AC current in primary coil.
- Electric field is induced through the ferrite links.
- AC current in secondary coil.
- The pipe and/or the water inside the pipe acts as the secondary coil.

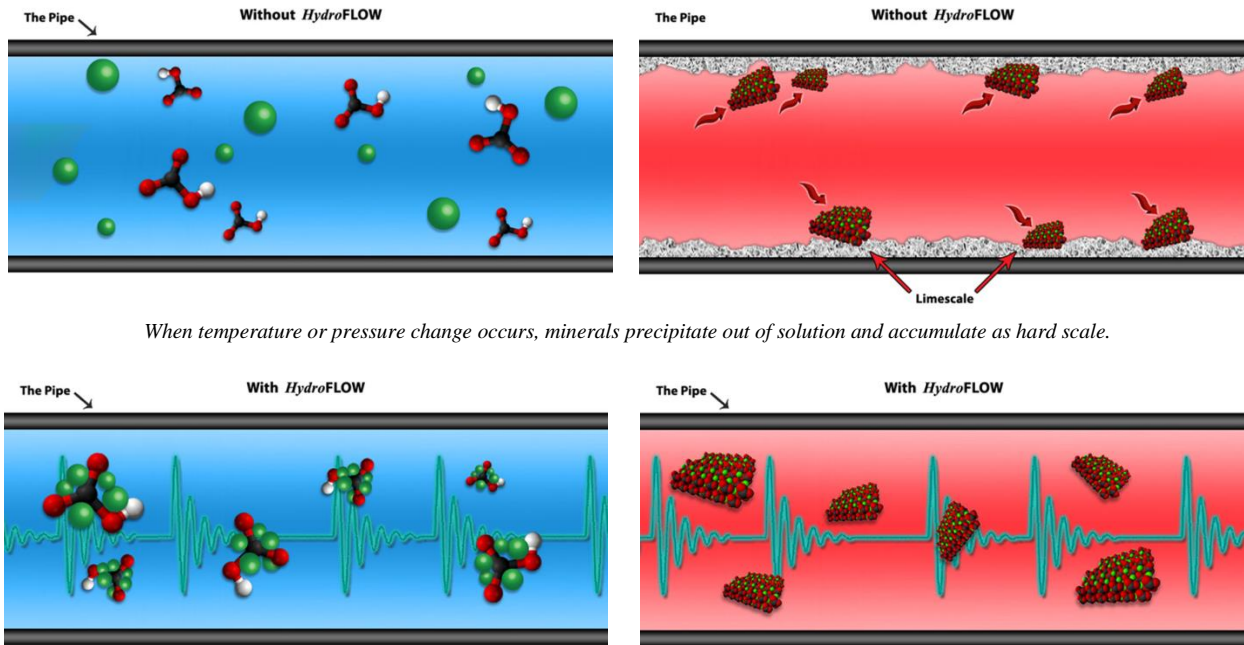


The patent behind Hydropath Technology



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sensitive business information

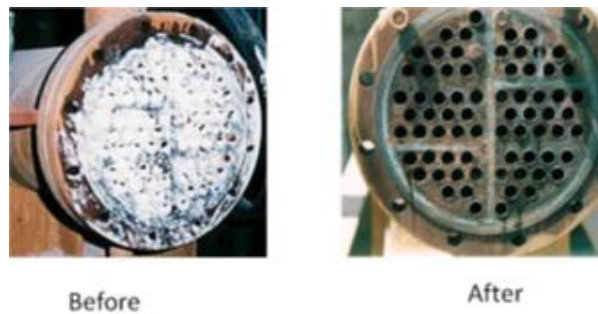
When dissolved in water, minerals are in the form of negative or positive ions. These ions can combine to form crystals, e.g. calcium carbonate, and it is these crystals forming on the side of the pipes that are known as scaling. The fact that these ions are electrically charged means that they can be manipulated by an electric field. When water is treated with the Hydropath technology, the mineral ions (dissolved solids) are clustered and shortly thereafter crystallized when exposed to heat and/or pressure change (i.e. the minerals precipitate out of solution and convert into suspended mineral crystals). This crystallization process prevents the minerals from attaching to equipment as hard scale.



When temperature or pressure change occurs, minerals precipitate out of solution and accumulate as hard scale.

When the Hydropath signal is present, dissolved minerals combine together to form loosely held clusters. When the clusters precipitate out of solution, they form stable crystals that do not accumulate as hard scale.

As well as preventing the buildup of lime scale, Hydropath technology can remove existing deposits. To understand how this occurs we need to look at the chemistry of the crystallization process in a bit more detail. When the dissolved calcium (Ca) and bicarbonate ions ($\text{HCO}_3)_2$ crystalize, they form calcium carbonate (CaCO_3 , limescale), carbon dioxide (CO_2) and water (H_2O). However, since the process can go both ways, water and carbon dioxide together can dissolve limescale. Therefore, when the Hydropath signal is applied to a system with existing scale; the signal promotes the formation of crystals in the water and releases carbon dioxide preventing further buildup of the scale. The released carbon dioxide then combines with the existing scale, releasing the ions back into the water, thus dissolving the existing scale.

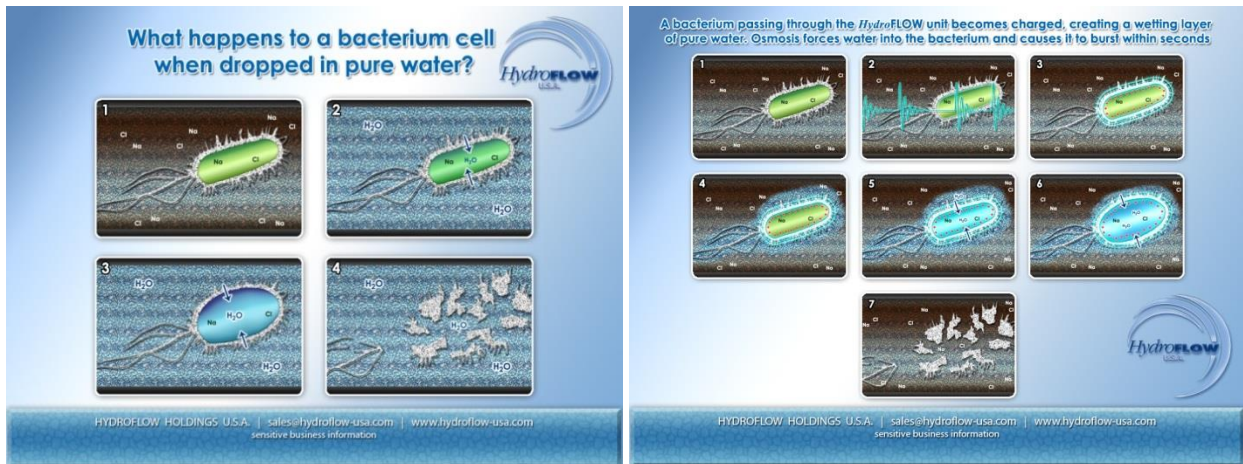


To the left is an example of the removal of existing scale in a heat exchanger. The exchanger was cleaned in three months by Hydropath technology, without scrubbing, acid cleaning or chemically treating the water.

Treatment of Bacteria and Algae

We can think of bacteria as essentially bags of different chemicals, where the “bag” is a semi-permeable membrane. Now let us consider bacteria in normal water. Even “fresh” water contains a certain amount of salt, and so we have a picture of each of our bacteria as a semi-permeable bag, with salty water both inside and outside the bag. Now consider what happens if the bacteria is dropped into distilled water, which is super-pure and contains no salt at all. Now, the water inside the bacteria is much more salty than the water outside. Due to osmosis, the water begins to flow from the purer region to the salty region, i.e. from the outside to the inside of the bacteria. This will affect the functioning of the bacteria, killing it, and the osmotic pressure will eventually cause the bacteria to burst

Hydropath technology uses this basic principle of osmosis to destroy algae/bacteria growth, by applying a charge to any alga/bacterium, passing through the ferrite ring of the unit. This in turn will attract a layer of highly pure water that forms a “wetting layer” or “hydration layer” around the bacteria. Once this layer of water has formed, osmosis begins to act and again forces the pure water into the bacterial cell, bursting it.



Main Sustainability Benefits

- Increase in the efficiency of water heating/cooling equipment by reducing scale and biofoul accumulation (i.e. reduction in petrol/gas/electricity consumption).
- Reduction in equipment wear and tear.
- Reduction in chemical costs.
- Reduction in maintenance costs.

HydroFLOW S38

Features and Specifications

Fitting:

Unit is suitable for all types of pipe material
Effect independent of flow rate
Treats as standard hardness levels up to 1000ppm Calcium Carbonate
Water above 1000ppm may require additional precautions



Dimensions

72 x 31 x 115 mm

Weight:

Approx. 0.5 kg

Safety Approvals: Europe and World Wide:

IEC61010-190+ A1:92 +A2:95 ~EN6 1010. Tested according to CENELEC
National requirements.
UL3101.1 CSA22.2 No: 1010.1-92

USA and Canada:

Panel Indicators:

Red
Signal is being transmitted into water

Unit Input voltage:

110-120 V AC - 60/50 Hz

Current Draw

100 mA

Unit Output Voltage:

12 V DC



HydroFLOW S38

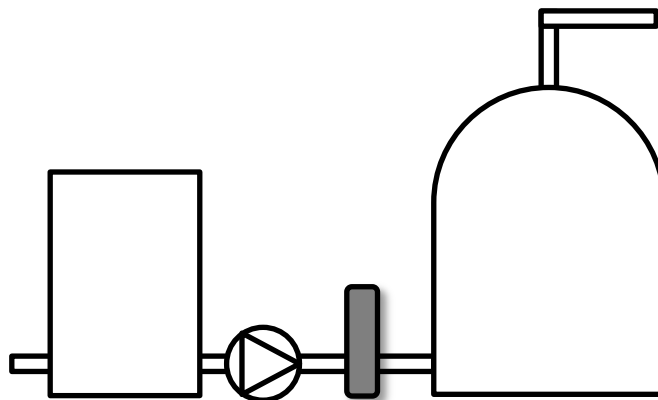
Features and Specifications

Technical Specification for water conditioning and the management of hard water scale

- Electronic ferrite water conditioner capable of scale management for whole house or for point of application.
- Fits by being clamped over the pipe; no cutting of the pipework is required.
- Suitable for fitting to up to 44mm OD copper, steel, stainless steel or plastic pipe.
- Induces randomly variable electrical fields into the water.
- Correctly installed, these fields will propagate through the water in the entire plumbing system and protecting taps, sinks, washbasins etc.
- The induced fields conditions the water both up and down stream. Wherever the fields are measurable, conditioning is maintained.
- The conditioned water will be capable of gradually removing existing scale in the system.
- The conditioning of the water is independent of water flow or temperature.
- Manufactured to ISO9001:2008 quality management standard and conforms to EU EMC regulations.
- Three year manufacturer's warranty and a calculated MTBF (mean time before failure) of 36 years.

Fitting the unit

- The optimum location to fit the unit before the cold feed to wherever the water is being heated.
- The unit should be fitted after any pumps and cold water tanks.
- Water stored in cold tanks can lose its conditioning over time
- Pumps can damage the conditioning effect.



S38 Unit should be fitted on the cold feed before the water heater, after any pumps or tanks

