



DOMESTIC

Halcyan Water Conditioners Technical Overview

2019

What it does

Operating impeccably overseas for over 30 years in the commercial and industrial sectors, the **Halcyan Water Conditioner** is a proven technology. It is designed to resolve the problems associated with hard water.

It does this by:

- 1 Significantly reducing lime scale accumulation.
- 2 Removing existing lime scale.
- 3 Creating softer water.

The benefits this provides and the problems it solves include:

- Reduced energy consumption (1mm lime scale on heating elements reduces energy efficiency by 10%) which means lower bills.
- Soft, gentle water for skin and hair; less frizz, more bubbles, less dry, irritated skin problems.
- Reduced maintenance, longer life and greater effectiveness for lots of household appliances including the boiler, kettle and washing machine.
- No ugly, hard to budge crustiness around taps, no scum lines in baths and basins, no clogging up of shower heads.
- Detergent and chemicals usage reduced by up to 50% means reduced environmental pollution and money savings.
- Significant time saving when cleaning, especially glass and chrome.
- Improving system pressure and flow.
- 'No scum' tea!

Why it's different, and better

The **Halcyan Water Conditioner** uses no salts or chemicals, no electricity, it doesn't use magnets, it doesn't have a sacrificial anode to replace, it doesn't add or take away anything from the water and it requires no maintenance, ever.

And it comes with a 30 warranty.

It's dead simple to fit, where the mains water pipe enters your property, so that this one device protects your entire home and family.

For all these reasons the **Halcyan Water Conditioner** is **the best solution** for your family, your home, your wallet and the environment.

Operation & Design

Each **Halcyan Water Conditioner** patented alloy core is designed and configured with specially foundry blended metals scientifically selected from both the Cathode and Anode end of the Galvanic Scale. Sized correctly, the patented catalytic alloy core changes the crystalline structure of the minerals in water greatly reducing hard water problems.

The turbulence generated in the **Halcyan Water Conditioner** creates an Electro-Chemical (galvanic) reaction between the crystalline minerals in the water and the catalytic alloy core. The **Halcyan Water Conditioner** core is figured to create a high degree of turbulence to occur in the water flow, and provides a more pronounced exposure and contact between the crystalline mineral particles and the metals in the alloy core. Immediately upon contact with the core the minerals begin to be dispersed into a colloidal solution. Colloids do not settle or precipitate therefore preventing the formation of scale.

Several key occurrences take place that bring about the colloidal formation;

The alloy core provides an immediate galvanic site upon which the ions can deposit.

The minerals are attracted and repelled several hundred times before clearing the alloy core.

Electrons are being captured from the water into the core and dispersed from the core back into the water, there is a very definite cathode-anode galvanic action.

Nuclei have been introduced into the system as a result of the cathode-anode reaction and provide a more positive site around which the mineral particles can attract, as opposed to precipitating onto the walls of piping or equipment. The scientific name for this reaction is more readily known as "epitaxial nucleation".

The Zeta potential and surface tension of the water is reduced.

Halcyan Water Conditioner

Effect on zeta potential and surface tension

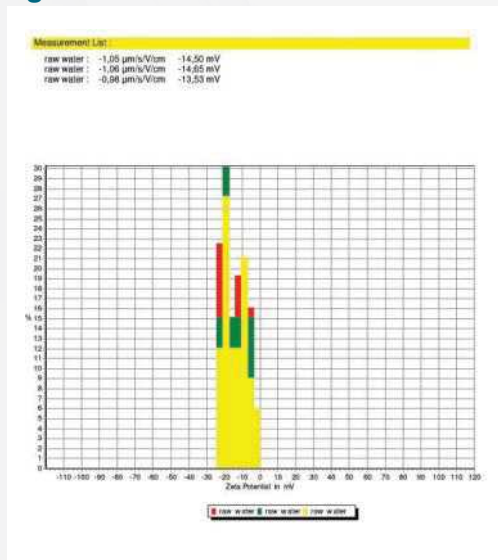


Untreated Water
Zeta Potential -14

Treated Water
Zeta Potential -7

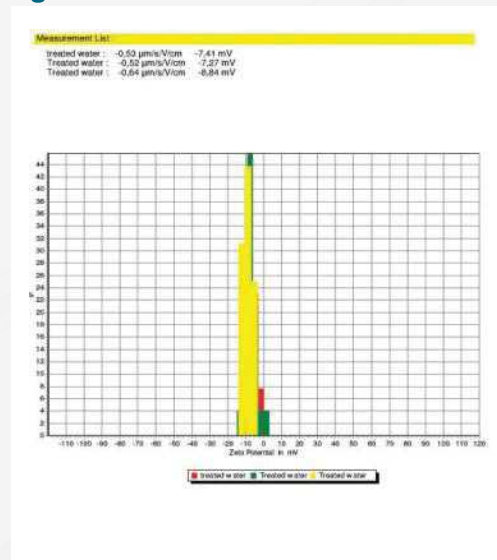
Colloids are held in suspension via a very slight Electro-negative charge on the surface of each particle. This charge is called Zeta Potential.

Figure 1



Zeta Potential of particles in raw water

Figure 2



Zeta Potential of particles in Halcyan Water Conditioner treated water

These results show that the **Halcyan Water Conditioner** has a great influence on zeta potential. In fact for water from the same origin, Zeta Potential is decreased by a factor of almost two. Very slight changes in the Electro-negative charge of the minerals in water can produce large effects downstream of the **Halcyan Water Conditioner**.

As the surface tension of water is decreased so is its ability to carry minerals. Surface tension and mineral charge are most easily understood if we think of positive charges and increased surface tension as scale forming or concentrating and negative charges and decreased surface tension as scale retarding or dissipating. Water surface tension is dramatically decreased after a single pass through an [Halcyan Water Conditioner](#). Samples of raw and [Halcyan Water Conditioner](#) treated water were generated on April 27, 2004 and were shipped to Core Labs in Calgary for analysis.

	Untreated Water		Halcyan Water Conditioner (Treated Water)	
Date	Room Temp	80 Degrees C	Room Temp	80 Degrees C
May 5, 2004	79.0 dynes/cm	N/A	69.5 dynes/cm	N/A
May 25, 2004	79.1 dynes/cm	69.2 dynes/cm	77.4 dynes/cm	67.5 dynes/cm

An 8 day old water sample having had a single pass through a [Halcyan Water Conditioner](#) demonstrated a lower surface tension of 9.5 dynes/cm which exhibits a surface tension similar in magnitude to water that has been heated to 80 degrees C.

This whole area of study is known as Colloidal Chemistry, Physical Chemistry, Surface Change, or Zeta Potential. It is a mixture of both physics and chemistry.



