

# ACP

## Active Catalytic Photo-Protection

Protects chlorine from photo-reduction by sunlight & UVc

- Nano-particle technology
- Reduce chlorine consumption
- Replace chlorine in private pools
- Protect chlorine from UV & sunlight
- Reduce chlorine reaction products from UV and sunlight
- Make all surfaces in contact with the water self cleaning
- Coagulate dissolved organics & and helps remove ammonium



### The problem

Chlorine disinfects water by chemical oxidation unfortunately chlorine combines with organic matter to form chemicals such as chloroform and cyanogen chloride. Chlorine also combines with ammonium and proteins to form organo-chloramines and inorganic chloramines such as trichloramine. Most of the chlorine reaction products are toxic to varying degrees and should be avoided or minimized when possible. There are chlorine free products available for private pools, but it is important to understand that the chlorine free products should not be considered for public facilities, leisure centres or private clubs because of the risk from horizontal transmission of pathogenic organisms between the bathers.

ACP may be used as a chlorine free product in private pools, or it may be used in combination with chlorine in private or public pools to reduce chlorine demand. The production of some chlorine by-products such as THM's is accelerated by Ultra Violet UV light, direct sunlight or even with light shining through the windows of an indoor pool. ACP shields the water and chlorine from short wavelength UV light, so the pools use much less chlorine and generate fewer chlorine reaction products.

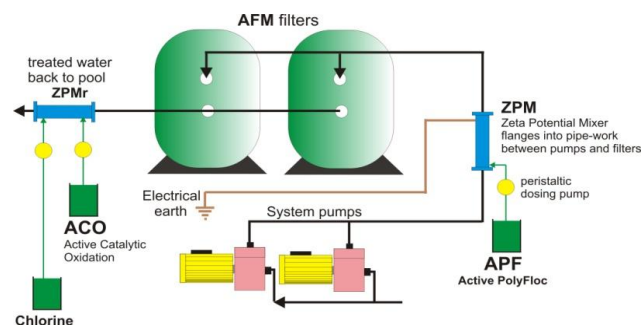
### What is ACP?

ACP active catalyst is a blend of poly-silicates and transition metal oxide nano-particles, very similar to a factor 30 sun-protection lotion used by people. The poly-silicates increase the zeta potential and drag +ve charged organics out of solution. The poly-silicate lays down a molecular thick layer high zeta potential skin on tiles and pipes to give a non slip surface that helps prevent bacteria growing. Any remaining ACP in solution, when it returns to the plant room will react with APF active polyfloc to form an alumina-silicate floc that drops out of solution on top of the filter bed. The floc includes both +ve and -ve charged pollutants that have been coagulated and flocculated from the water. The floc is large, stable and heavy so ACP helps to improve the performance of filters that are under-sized or are not running at the optimum water flow. The alumina-silicate formed between ACP and APF exhibits ion exchange properties and will remove ammonium from solution to help prevent inorganic chloramines. The nano particle component of ACP is catalysed by the ZPMr unit, sunlight or any UV light source. UV wavelength photons are absorbed by ACP which then kicks out an electron to increase the redox potential of the water and the ability of the water to self-disinfect, but no chemicals are consumed in the process.

### Why use ACP?

Sunlight or UV light in the presence of chlorine, ammonium and organic matter will cause photo-oxidation. Chlorine consumption will increase, and more toxic volatile lipid soluble chlorine by-products are formed, combined chlorine levels may drop especially when medium pressure UVc irradiation is used, but the chloramines are replaced by chemicals such as cyanogen chloride and THM's that are much more dangerous. ACP absorbs ultra violet light and protects the chlorine from photo-oxidation, so less chlorine is used. Atmospheric conditions improve, stress corrosion cracking of the building and ventilation systems is reduced and there will be a return in expenditure out of revenue savings.

Dryden Aqua is perhaps the only aquatic biological company working in pool water treatment and through an understanding of chemistry, biology and nature, we have an insight that has allowed us to develop ACP for the protection of dolphins in chlorinated systems. We do not advocate that you stop using chlorine, but ACP as part of an integrated water treatment approach will reduce your chlorine demand by up to 95%, and may eventually eliminate the need for chlorine.



"open your eyes with ACP"

### How to use

- ACP is best when dosed into the water using a ZPMr mixer (Zeta Potential Mixer-resonating) after the AFM filters
- The application rate is 0.5ml to 1.0ml per 1 cubic metre of water per hour pumped to the filters. Example; if water flow is 20 cubm/hr to the sand or AFM filters, the APF application rate is 10 to 20 ml per hour
- ACP may be hand dosed, application rate is 10 ml of product per cubic metre of water in the pool, if the pool has 80 cubm of water, you will need 800ml of ACP to be added once a week.

### Information

- ZPM = Zeta Potential Mixer, APF works because it drops the zeta potential of the water, ACP increases zeta potential in the pool
- AFM (Active Filter Media) dramatically improves the performance of sand filters because it works synergistically with APF and our ZPM
- Dosing pumps available from Dryden Aqua.
- ACP is supplied in 25 litre and 5 litres containers as a liquid ready to use.

Dryden Aqua Ltd

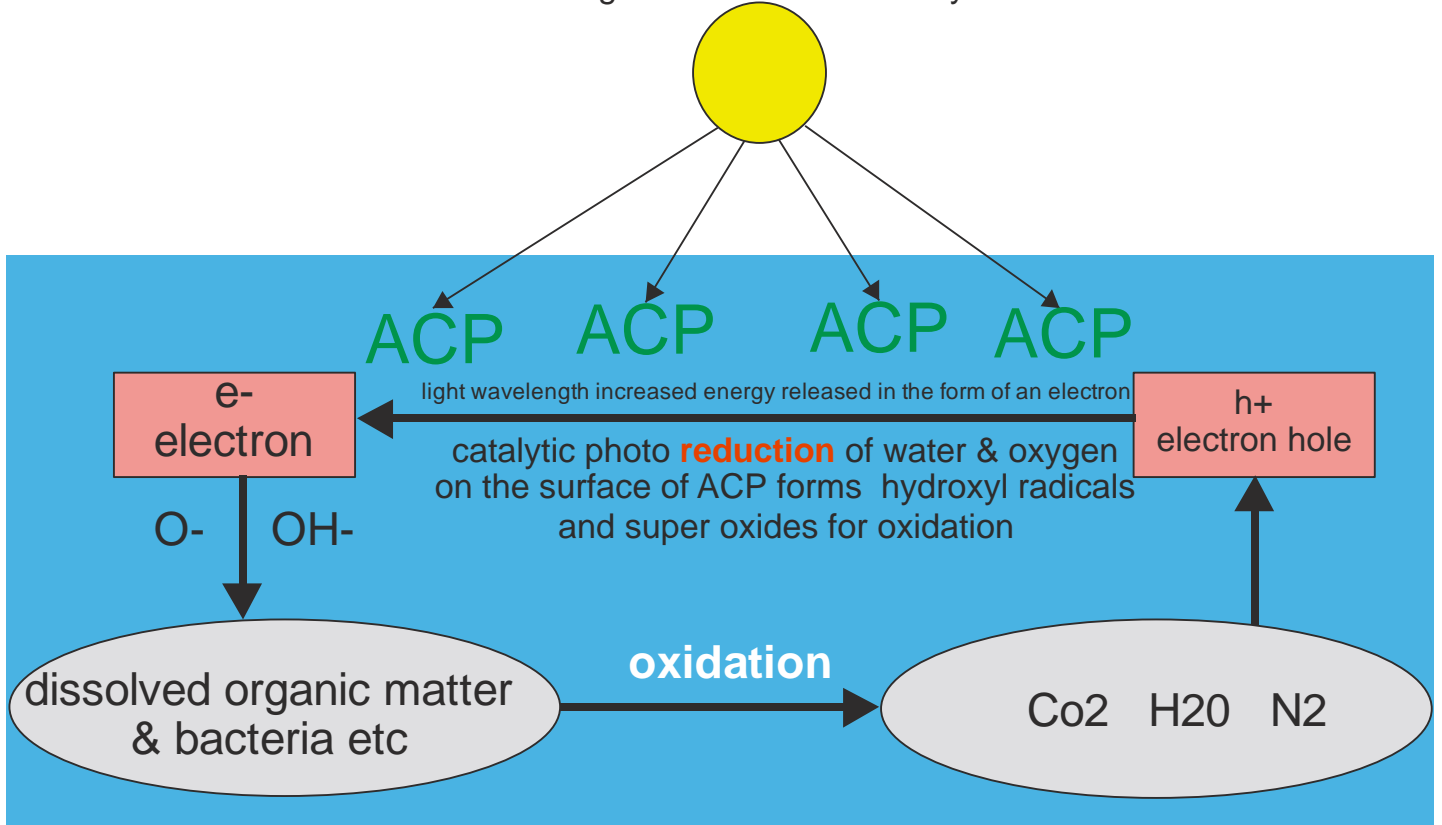
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### Light or ZPMr

sunlight, out-doors  
through windows or even  
florescent lights & Uvc irradiation systems



Dryden Aqua ACP is provides a sun bloc for the protection of chlorine from photo-oxidation in open system such as swimming pools and reservoirs. ACP can also be used in combination with other process to provide amplified oxidation reactions for the cracking of proteins in bacteria and viri as well as dissolved organics and toxic chemicals. Medium pressure UV irradiation may be used with ACP, Hydrogen peroxide or ozone, however in order to avoid the use of chemicals and minimise the production of volatile lipid soluble chlorine reaction products, Dryden Aqua have developed a sono-chemical acoustic cavitation Zeta Potential Mixer. The ZPM module is flanged into the pipe-work and is fitted with a resonator

#### Applications

- Swimming pools indoor & out-door
- Natural swimming pools
- Freshwater and marine system, lakes and fountains
- Large scale systems such as a Lido exposed to strong sun-light
- Aquatic enclosure for marine mammals
- Aquaculture system, marine hatcheries and aquaria
- Cracking of hydrocarbons, proteins and complex molecules
- Environmentally friendly and economic water treatment without chemicals
- Advanced catalyzed sono-chemical and photo chemical-oxidation of water



Eliminate chlorine reaction products to prevent damage to the epithelial tissue of aquatic mammals as well as humans. Reduce or eliminate lipid soluble volatile chlorinated by-products. Save money, reduce chemicals and make our environment safer healthier place for everyone.

