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From the Director:

The lead up to our 2017 southern swimming season started much earlier than usual and was unusually busy. Rather than petering off after the Big Break and school holidays as it usually does, it continued right up to Easter. And now, with overnight temperatures in the very low single figures, this edition, which was originally drafted as our Summer 2018 edition, has had to be rebadged as our Winter Edition.

But the primary reason for the delay is that increasing industry awareness of our unique industrial ionisers are causing us to place a much higher priority on these products, applications, which unlike swimming pools, have the distinct advantage of not being season-sensitive.

Water purification by Ionisation – Fact or Fantasy?

A number of enquiries and questions from established customers prompted me to dust off up a generic article which was first published for a trade magazine way back in 2010, and is just as relevant today. Of interest is that at the time of original publication, many pool shops were openly hostile to our low chemical systems – some still are - but as Aquavic's ionisers become more widely accepted by pool owners, one glance at the Testimonials on our website confirm that attitudes have changed.

For the purposes of this discussion, "Ionisation" refers to the process of enhancing water quality by electrolysis as applied to electrodes of Copper / Silver alloy. The selection of these particular metals is based upon the algaecidal properties of copper and the bactericidal properties of silver. When released by electrolysis and released into a body of water, the result is a very effective, environmentally-friendly, and low cost aid to the question of water quality in swimming pools, spas, fountains, water features.

Ionisation as we know it today, is the process of placing pairs of electrodes into the system's pipework and applying a low voltage DC current to them. Assuming that conductivity requirements have been satisfied, (see below) the current flow between the electrodes causes the positive electrode (anode) to "burn away" and in so doing, releases copper and silver ions into the water in proportions as determined by the composition of the alloy, which, in our case, is 95% pure copper and 5% refined silver. Electrodes are therefore a consumable item and will eventually burn away to nothing. Their life expectancy varies from pool to pool, but 3 to 4 years is about the norm.

They are, by law, also deemed to be an "agricultural chemical" believe it or not, and, as such, must be registered with the Federal Government Regulator, the APVMA. By way of comparison, the salt cells used in chlorine gas generators - aka salt chlorinators - also function on a similar principle, but are exempt from registration - *and they're converting salt into the very same chlorine gas that was used to such deadly effect in the trenches of WW1*. Level playing field? I don't think so.

Polarity (positive and negative) is uniformly switched to ensure an even "burn" of the electrodes. It also ensures that the electrodes rarely need cleaning. If the polarity wasn't changed, the consequences are that one electrode (the anode) would burn away completely, and the other (cathode) would become badly fouled. Of interest is that manufacturers of Chlorine Gas Generators have now adopted this feature into their products and promote them as "Self Cleaning" Salt Cells. Better late than never, eh?

The "soluble" Copper and Silver emitted by the process becomes part of the water chemistry. The concentration of Copper ions varies with the application but it is typically 0.3 mg/L, a figure that is well within the World Health Organisation's limit for potable water. In common with a number of alternatives, the effectiveness of ionisation is dependant on a level of attention to the water's basic chemistry or balance, with TDS, TA, temperature and pH all playing important roles. Typically, to ensure a reasonable expectancy of current flow between the electrodes, the TDS should be > 150 ppm. The TA, or stability of the water, is also important and should be controlled at 90 – 140 ppm. Ionisation, in common with Chlorine, is more potent with a pH of around 6.8 – 7.2.

Amongst the chemicals typically chosen to maintain the above numbers are Sodium bi-carbonate to increase pH, hydrochloric acid, or dry acid (sodium bi-sulphate) to reduce TA and pH, and calcium chloride to enhance. Once established, TDS rarely needs "topping up" as it is more likely to increase slowly of its own accord and may, after many years, create a short-circuit between the electrodes. Routine back flushing of the filter or dilution with a quantity of fresh water will keep it in check but if the water is over 5 years old, consideration should be given to dumping the water as a matter of course.

Worthy of note is that, way back in the 90's, ionisation was chosen for the 2.8 million litre water features in the Parliamentary Triangle in Canberra, and for the water feature which dominates the approaches to the Federal Court. One of the most significant points favouring selection was concern about the loss of saline water associated with the original salt chlorinators and their proximity to Lake Burley Griffin.

As with any process, there are always catches and ionisation has its share. To be effective, there are several prerequisites, which must be acknowledged. The first is that the system should have an effective and well-maintained pump and filtration system. The effectiveness or otherwise of the installation will be directly proportional to the degree of circulation. And as with any maintenance regime, care should be taken to ensure that all water is returned to the filter – not just the top 20% as is the case with virtually every domestic pool.

The second is that somebody must take responsibility for the water chemistry. Water should be seen as a living, breathing thing and, as such, must be monitored and adjusted as required. For public swimming pools, the frequency and extent of the testing is closely controlled by local authorities. Private domestic pools need only be tested weekly in summer, monthly in the off-season. Public or private, "somebody" needs to take responsibility for the water, check the chemistry and adjust as necessary – and keep a log.

Finally, by far he majority of pool owners choose to enhance the performance of their ionisers in peak season with one of the many non-chlorine, oxygen-rich, oxidisers now on the market. Others choose to use micro doses of chlorine. And yet still others, use nothing at all. What ever works for you is what you use.

The Director