ACIDE

THE OFFICIAL MOUTHPIECE OF THE AQUAVIC IONISER USER'S GROUP

Quercus Magnae a Glandibus Crescant

PROUDLY MADE IN AUSTRALIA

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From the Director:

One of the frustrations of running a business is the difficulty of getting reliable and accurate customer feed-back on your products. Because that direct link is established from day 1, this frustration does not necessarily apply to products which we've sold directly from our office, but more so with those that were sold and installed by agents, pool service people, or the customers themselves. There is one notable exception to this rule and that is on the rare occasion that one of our units is judged to be underperforming, we very quickly hear about it as negative feedback is always supersonic.

Fortunately, in the vast majority of these cases, the cause is identified as something as basic as the complainant failing to read the instructions (*I guess we're all guilty of this from time to time*) or an adverse event resulting from malicious, mischievous, or ill-informed advice of others. But of the others, we hear very little indeed, and we often wonder whether the units have lived up to the owner's expectations, or, worst case scenario, failed miserably and the owners have simply given up in disgust.

Enter the EEL:

As time goes by, one feature that is beginning to emerge as an excellent *de facto* indicator is based on the reality that, from time to time, the electrodes burn out and need to be replaced. This works along the lines of the fact that the electrodes are a truly consumable item and eventually wear out.

And every time a customer discovers that their electrodes have all but disappeared – or worse! – they contact Aquavic for a replacement set. The number of replacement sets sold is then added to a file which we've labelled the **EEL** index. *In keeping with the aquatic nature of our business, and the public's apparent hunger for acronyms,* ***EEL*** *is an acronym for "****E****ffective* ***E****lectrode* ***L****ife".*

Each request for a replacement set then establishes direct contact with the customer, and this in turn presents us with the perfect opportunity to obtain that much-sought after feedback. Of great interest to us is that, as the data base grows, we are yet to record one example of a dissatisfied customer ordering a replacement set. (The counter argument would be along the lines that the sample is flawed because unhappy customers are unlikely to be ordering new electrodes). True, but when judged as a percentage of the number of satisfied customers (becoming known) against the total number of electrodes sold (already known) the number is most satisfying. Most satisfying indeed.

Filling the Knowledge Gap:

We recently received a call from a pool tech. reporting that one of our beloved "*New Millennium*" Series II units was not working, and as they had only been on the market for a number of months, the report was followed up with what can only be described as indecent haste - in spite of the fact that the incident was a good 3 hours drive away (and 3 hours return) - in 40 deg.C temperatures.

What we found was most interesting as it reinforced the old saying, "*It doesn't pay to assume as it makes an **ASS** of **U** & **ME***" and in this instance we were very definitely the ***ASS*** as we had assumed that the tech, a bloke of some considerable industry experience, was familiar with the test procedures associated with ionisers. Not so. But what really concerned us was that if a fellow of his experience didn't fully understand them, *it was a pretty safe bet that neither did the majority of his colleagues.* Problem identified. Solution required.

It would have been so easy to blame the tech for not having identified the fault, and then raised an invoice for a service call, but, having identified the problem very clearly as ours, the ball was then very clearly in our court to address this apparent knowledge gap and understanding of this ages-old pool sanitising system. So, for the benefits of all ioniser owners in general, but for pool service techs and other industry pros in particular, the following may go some way to filling the knowledge gap.

It took only minutes to confirm that the control unit in question was doing exactly what it was supposed to do, but the electrodes – which happened to be those of another maker - were not! Suffice to say that they had not been installed as per their maker's specifications as they were too far apart (this dramatically reduces the current flow from one to the other) and, as a direct result of the low current flow, both had developed an almost impervious ceramic-like coating that was acting as a very efficient insulator. And absolutely the last thing that an ioniser needs is nil or severely impaired current flow from one electrode to the other. No current = no ionising = green pool = very unhappy customer.

Overview
Ionisers, as most of us know them, consist of two vital parts: an electronic control module, and a pair (or pairs) of electrodes. A flowcell makes up the trifecta, but, for the purposes of this discussion, as it is collection of inert PVC components designed specifically to house the electrodes, we'll disregard it, and we'll do the same with inbuilt timers etc. Let's look at ionisers in their most basic form.

Control Module:
This unit converts your ordinary but potentially lethal 230 volts, 50 cycle, single phase, household power supply to the very safe **ELV** (extra low voltage) direct-current (same as torch batteries) required to "drive" the system. But dropping the voltage and converting it to DC is simply not enough. If we were to connect this to our electrodes, one (**anode**) would "burn" away and the other (**cathode**) wouldn't. Not a very desirable situation at all.

Polarity Switching :
To overcome this undesirable situation, some smart electronics inside the box, electronically swap these connections over every two to three minutes, a condition we call **polarity-switching**. So what we have now is a box of goodies that not only drops the household supply to a safe level, but it also converts it from **AC** to **DC** – and switches polarity to boot, a feature which is mimicked by the two "**POLARITY**" lights on the panel. So far, so good? OK.

Electrodes:
These are the other part of the equation, and our aim is to very slowly convert each of them from solid chunks of metal – usually a copper/silver alloy, or, alternatively pure copper – slowly but surely into extremely fine metallic particles and distribute them evenly throughout the pool so that they become

part of the water chemistry. And as they are very definitely a consumable item, they have a finite life and will gradually get smaller until there is literally nothing left but their stainless steel terminals.

The Process:

If we were to simply introduce a pair of electrodes to the water, we'd be waiting a very long time for anything to happen, a very long time indeed, so, to accelerate the process, we connect our recently acquired, "*extra low voltage, polarity-switching, DC power supply*" to each of them. But (there's always a "*but*") to get a result, *we have to be sure that the ELV current is able to travel* ***through the water from one electrode to the other****. This is very important indeed!*

And for this to happen, the **conductivity** (i.e. the water's ability to transport the current from one to the other (and generally expressed as **TDS**) is most important, too. If the water is too fresh, the **TDS** is too low and nothing happens so we usually add a few kilos of pool salt to help things along. On the other hand, if it is already saline or highly mineralised bore water, it may be too conductive and we run the risk of having a short circuit, which, with our units, would simply cause the control module to switch to trickle charge until the problem was addressed.

Let's now assume that the water is OK and that current is flowing from one electrode, through the water - the **electrolyte -** to the other. If so, then the current causes one electrode (**anode**) to "burn" away thus releasing very fine particles of the parent metal (silver and/or copper) directly into the circulating pool water – and some minutes later the control unit swaps the polarity, on so on. This **polarity switching** which has been a feature of ionisers for over 5 decades, ensures that both electrodes are not only self-cleaning (a feature only recently discovered by the chlorine gas generators aka salt chlorinators fraternity) but that they burn away at the same rate until there is literally nothing left – and that's when you call us for a new set – and we add you to our **EEL** index!

Diagnostics:

One of the first steps a pool service tech should take when checking an ioniser is to measure the **voltage** at the electrodes (both open circuit and under load) and then the **current** flowing between them. (Alternatively, we could also measure the resistance from one to the other through the water, but let's stay with current for the moment). These results are then checked against the performance chart for that particular unit, and if it falls outside our design criteria, we need to know why.

With reference to the example mentioned earlier, a check of the **DC voltages** confirmed that all was in order, but a check of the **current** found very little current flow - and therefore the ioniser was doing virtually nothing - and hadn't been for quite some time. We then hooked it up to our portable "dummy load" (a simple device that allows us to simulate the conductivity of any water sample) and once again the unit was confirmed as OK. So! The problem very clearly lay with the electrodes themselves.

The flowcell was dismantled and the electrodes removed. Close examination of each then revealed the ceramic-like insulating coating as mentioned above, and this was doing an excellent job of ensuring that the **current** was never going to pass between the electrodes. After much scraping which virtually ruined a perfectly good pocket knife, we managed to expose enough bare electrode metal to get the system operating again. Unfortunately, by the time the fault was reported, identified and rectified, the customer had lost confidence and insisted that the unit be removed – and who could blame him?

Summary:

The upside was that we had identified a diagnostic problem, a problem that needed to be addressed – particularly so amongst the techs who are not all that familiar with ionisers. And with the ever-

increasing number of ioniser in the field, they may well find themselves facing similar problems at any time. It may even be the next service call.

Although presented in its most basic form, hopefully this article will go some way to fill that knowledge gap, but we strongly recommend that pool techs acquire a **multimeter-tester** as they are an invaluable **diagnostic tool**. Even the $20.00 disposables that we carry in our tool boxes come in very handy indeed – and at $20.00 replacement cost, it doesn't matter if you drop it in the pool, run over it, throw it at the ducks, - or leave them behind!

Having dealt with the ioniser, it's now time to turn our attention to the water chemistry, but as that's pretty well stock standard stuff for most pool techs we'll "take it as read" but for our customers, if you require a copy, contact our office or visit our website or give us a call.

Bootleg Electrodes:
Further to an article that appeared in (Vol.9 – 3) on the mandatory registration/approval of ioniser electrodes, we are advised that a number of suppliers are offering cheap electrodes which are claimed to be "*drop in replacements."* This may or may not be the case, but what is important is that, by law, the electrodes must have an **APVMA** approval number. If they don't then we'd like to know as we take a dim view of opportunistic vendors obtaining a free ride on the growing popularity of ionisers.

If the suppliers of these products are so keen to support ionisers, then they can do what the rest of us have had to do – **spend the money, convince the Federal Government Regulator of their suitability for their intended purpose, and get them registered**. We acknowledge that paying initial registration application fee, then the on-going annual registration renewal fee, and the levy on every pair sold is a disincentive, but them's the rules.

Remember that a registration number is also your guarantee of quality and also that the electrodes you purchase do in fact have the active constituents as stipulated on the registration label.

If you *have* been tempted by the low price, don't be at all surprised if your budget priced "drop in replacements" burn out very quickly and/or shown very early signs of "honeycombing" which, as the name suggests, is indicative of the inferior quality of the alloy, a feature usually associated with a product from a third world country.

2010 Products & Prices:
A PDF of our "***2010 PRODUCTS & PRICES (TRADE) CATALOGUE***" is now available to trade subscribers. Please delete your 2009 version and contact our office for an update. And for others, copies of the "***2010 PRODUCTS-ONLY CATALOGUE"*** are also available on request.


The Director.

"If you wouldn't drink it, why would you let your children swim in it?"