



HOW TO SERVICE A POOL RUNNING ON THE AQUABRITE SYSTEM

1. **On arrival at the pool check the pH and DPD readings.** The DPD test should be read 15 minutes after adding the DPD No.1 tablet. If the reading is less than 2 (on the chlorine scale) add one pack of Aquabrite for every 50,000 litres of water in the pool.
2. Carry out the usual maintenance jobs while waiting for the DPD reading: clean out the leaf basket, adjust the water level, vacuum the pool etc.
3. **If the DPD reading (after 15 minutes) is less than 2.0 on the 'chlorine scale' then add one pack (1Kg) of Aquabrite for every 50,000 litres of pool water.** Check regularly, especially in summer.
4. Aquabrite should be added to the pool **IMMEDIATELY** after storms or heavy usage to **PREVENT** any problems occurring - not used to fix it up, as is usual in the case of chlorine. (see algaecides p.2)
5. Check the copper concentration using the copper test kit provided. **The copper reading should ideally range from 0.6ppm to 1.0ppm(max).** Check regularly using the Aquamatics Copper Test Kit provided. The tablet-type and 'dip-stick' type of copper test kits are not sensitive enough.
6. Ideally, pH should range from 6.8 for (fibreglass pools) to 7.4 for all other types.
NEVER allow the pH to remain above 7.6 or below 6.5
7. Total alkalinity (**TA**) range from **80ppm to 120ppm.** (p.6) Check every month.
8. Calcium hardness (**CH**) range from **100ppm to 250ppm.** (p.6) Check every 2 months.
9. Total Dissolved Solids (**TDS**) **should not be less than 300ppm or more than 1200ppm.** Check every 2 months or after continuous heavy rain.
10. Liquid or dry chlorine may be used with Aquabrite as a co-disinfectant and bleach for leaf stains. Add a dose, which does not exceed the stand-alone dose for free available chlorine, to the skimmer box with the filter pump running. Check using the DPD test kit but take a reading 30 seconds after addition of a DPD #1 tablet to obtain a reading for free chlorine.

11. **Do NOT add chlorine stabilizer (isocyanuric acid).**
12. **Do NOT use aluminium-based pool clarifiers.**
13. **Do NOT adjust the pH with soda ash, pH UP, (sodium carbonate), only use buffer (sodium bicarbonate) dissolve first and add it around the pool or via the skimmer.**
14. **Do NOT use bromine or bromide compounds.** This is important especially in the case where a spa shares the same filtration system as the pool. The spa water, which is traditionally treated with **bromine** tablets or sticks, will be mixed with the pool water, which is treated with the **Aquabrite System. The two systems are incompatible.** Aquabrite should be added to the spa at the rate of 50 grams per 1000 litres of spa water followed by 25 grams of buffer, instead of bromine.(see note 10 above)
15. **Do NOT use algacides which contain copper.** If the copper level needs to be increased then call Aquamatics technical staff or your supplier for assistance.
16. **Do NOT add sodium carbonate peroxyhydrate (percarbonate) or sodium tetraborate compounds. They are both very alkaline, incompatible with both Aquabrite and chlorine, and will increase the pH of the pool water.**

NOTES:

Aquabrite is a blend of special peroxygen compounds, which form an acid solution when added to water.

Each 5Kg addition of Aquabrite requires about 1Kg of sodium bicarbonate to maintain correct water balance in the pool. This is much more important in painted, tiled, vinyl and fibreglass pools than cement-based pools. **Aquabrite should not be confused** with hydrogen peroxide (neutral liquid) or percarbonate-(also known as peroxygen compound) - a strongly alkaline powder - neither of which are suitable substitutes for Aquabrite.

Aquabrite has three functions:

1. OXIDISER - OXYGEN BLEACH - (oxidises organic debris which enters the pool)
2. CATALYST - (activates the silver ions produced by the ioniser)
3. POOL ACID - (replaces some of the acid demand in the pool)

NEVER mix Aquabrite powder or strong solutions with any other pool chemicals.

Remember that although it has no chlorine smell it is still a strong oxidiser.

If a packet is opened the entire packet should be added to the pool. There is no advantage in keeping a part pack of chemical lying about as it is not destroyed by the sunlight on the pool so it is more useful in the pool.

DANGER !

Do not allow Aquabrite powder or concentrated solutions to come into contact with salt or chlorine as the extremely poisonous chlorine gas will be produced.

THE IONIC UNIT GENERATES IONS OF COPPER AND SILVER

The copper ions kill or prevent most of the 5000 or so varieties of algae from growing in the pool.

On rare occasions there may be a copper-resistant strain in which case an algaecide may need to be used. We recommend Algimycin, concentrated Black Spot Treatment, and Metal Free Algaecide which contain polyoxyethylene(dimethyliminio)₂ ethylene₂ dichloride.

Use these algaecides carefully and follow the instructions closely.

Silver ions kill bacteria.

Silver ions which have been activated with Aquabrite kill bacteria faster than chlorine in contaminated pool water.

The reason for this is that the active positive ions target specific negative sites on the bacterial membrane which then inhibits transpiration of the organism.

There are also irreversible chemical reactions with proteins in the protoplasm.

Degeneration of the membrane results in the organism's rapid destruction.

However, **it is necessary to maintain the silver in an active form** to ensure optimum performance of the system.

This means the addition of Aquabrite to give a DPD reading of 2.0, or above, on the 'chlorine' scale of the test kit, (after 15 minutes reaction time.)

Unlike Aquabrite, chlorine is largely destroyed by sunlight and side reactions occur with nitrogen contaminants (ammonia and amino acids) in the water to form 'smelly' chloramines. Aquabrite, at the recommended concentrations, is able to destroy the chloramines as they are formed.

POSSIBLE PROBLEMS AND THEIR SOLUTIONS

1). **HIGH COPPER READING.**

Over-ionisation possibly due to excessive operating times of the Ionic unit for the volume of water being treated.

This may be confirmed by a high copper reading in the water, although a high copper reading does not necessarily mean that the copper originated from the Ioniser electrodes.

Other sources of copper should also be investigated such as gas heat exchangers, copper piping or the use of copper-based algaecides.

To remove excess copper from the water treat the pool with poly-aluminium chloride or filter alum. Follow the instructions on the pack for the treatment of pool water. As a rule of thumb, every kilo of filter alum will require half a kilo of soda ash (sodium carbonate).

It is a good idea to *fill the pool right to the top* and take the cartridges out of the filters or the 'fluffy' alum floc will quickly block the filter membranes.

Where multiport valves are fitted, set the valve to the 'RECIRCULATE' position.

The (aluminium hydroxide) floc, which is formed, will adsorb metal ions from the water under neutral or *slightly alkaline* pH conditions and then settle to the floor of the pool over a period of several hours, usually over-night.

The *extra water* is required to allow for vacuuming the settled sediment to waste the next day.

2). LOW COPPER READING.

This may be due to:

a). Insufficient operating time per day.

b). TDS high or salt water in the pool.

c). Electrodes require replacement.

d). Aluminium clarifiers being used.

e). Ionic unit undersized for the pool.

f). Pool leaking and being frequently topped up.

g). Continuous heavy rainfall.

h). The pool is being topped up with tank water.

Action to take:

Check instructions for operation.

Run Mk5 1Hr per 10,000 litres in summer.

“ Mk 9 “ “ 20,000 “ “ “

“ Mk10 “ “ 100,000 “ “ “

Fit heat-shrink sleeves over electrodes or drain, clean and refill the pool.

Fit a new pair of electrodes obtainable from Aquamatics P/L.

Add special start-up kit to pool. Check filter, use polyelectrolyte clarifier instead of alum type.

Fit an additional unit to boost ions.

Locate and fix the leak.

Low conductivity water – needs to be chemically balanced.

Tank water and some dam waters have very low mineral content. This water is unable to support ionisation and should be balanced

3). LIME GREEN WATER.

This may be due to:

a). pH too high (above 7.6)

b). Aquabrite level too low
(less than 1.0 ppm after 15 min reaction time)

Action to take:

Reduce to normal range with pool acid (7.0 to 7.4 range)

Add Aquabrite to obtain a DPD reading above 3.0 ppm (requires 24 hrs to take effect, add 2 litres of liquid chlorine)

c). Total alkalinity too high or too much buffer added at once.

Limit the addition of sodium bicarbonate to 1Kg per day. **Do not let the pH rise above 7.6.**

d). Calcium hardness too low.

Adjust in line with chemical balance (above).

e). Inadequate filtration.

Extend the daily filtration time to 1 hour per 10,000 litres of pool water in the pool.

f). Solar heating effect.

Add 2L liquid chlorine to pool while solar pump is running.

g). Peroxides or biguanides used.

Add Potassium monopersulphate (1Kg per 10,000L of pool water) to 'burn-out' biguanides.

4). **CLOUDY WATER.**

This may be due to:

Action to take:

a). Calcium hardness too high - pH too high.

Replace some of the pool water with fresh water. Lower the pH of the pool.

b). Carbon dioxide gas.

Formed when buffer is added to acidic pool water or acid is added to pools with a high total alkalinity. The water will clear after a few hours.

c). Low copper reading.

Check that the Ionic unit is working. Check electrodes and replace if badly worn.

d). Inadequate filtration time.

Set longer filtration times on the pool time- clock.

e). Backwashing sand filters too often. (also sand filters on indoor pools)

A sand filter which is too clean filters water poorly. Add a handful of filter powder to the skimmer.

f). Filter requires backwashing.

If a sand filter is full of rubbish there is insufficient turnover of the water so the water in the pool remains largely unfiltered. Backwash the filter more often. Empty the skimmer basket and the lint filter.

g). Hole in septum of D.E. filter.

Check for D.E. powder on the floor of the pool under the return outlets.

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|--|---|
| h). Air being sucked into the pump. | This can usually be seen as air under the lint filter lid and a stream of fine bubbles from the return to pool outlets. |
| | Check for holes in pool hose or low water level in the pool. Also cracked or ill-fitting lint filter lid gasket. Replace with a new lightly-greased gasket. |
| i). Pool-water level too high so that the skimming action is prevented | Lower water level to half-way up the skimmer plate. |
| j) Multiport valve seal failure. | Replace 'spider gasket' or valve. |

CHEMICAL BALANCING OF THE WATER AFTER FILLING THE POOL.

Some pool service people find this a chore and have difficulty understanding why various chemical factors are really necessary.

Forgetting all the science behind it – the water should exhibit certain qualities.

It must be:

- 1). **Aesthetically pleasing in terms of clarity, colour, smell and taste.**
- 2). **Free of substances which cause skin or eye irritations.**
- 3). **In a sanitary condition. No algae or slime (biofilm) on the sides of the pool or within the filtration system and no algae or bacteria in the water.**
- 4). **Free from chemicals which are toxic to humans.**

Control 1 & 2 above by adding certain chemicals* to the water and filtering all the water in the pool each day. Sand or diatomaceous earth (D.E.) filters are used especially on larger pools. Cartridge filters are often used on spas and small pools. Correct maintenance procedures for each type of filter is very important to maintain optimum water clarity.

*Oxidisers are used to burn out both soluble and insoluble organic contaminants and cause the water to appear 'polished' to crystal clarity. Acids or alkalis are used to adjust the pH.

Clarifiers, algaecides and numerous other chemicals are available to the Pool Serviceman, who must be familiar with their application and compatibility.

Either a low or high pH and/or low TA typically cause eye and skin irritation.

(needs buffer)

The pH can be stabilised in a pool by adding sodium bicarbonate (buffer) and calcium chloride (hardener) then adjusting with dry pool acid to within the correct range.

Dry pool acid will need to be added a few times until the pH stabilises.

Never throw large amounts of chemicals into a pool – this may bleach, discolour or etch the pool interior.

Dissolve them in water in a plastic bucket and distribute as evenly as possible around the pool or add them slowly to the skimmer box with the filter pump running.

When using a bucket always add the chemical to the water a little at a time NEVER add water to chemical as considerable quantities of heat may suddenly be produced, possibly causing an explosive reaction. Never mix chemicals together.

How much? 60-80ppm for Fibreglass, Paint and Acrylic and 80-120ppm for Concrete finish.

The total alkalinity reading should ideally start at about 120 ppm. That's equal to 2.0 Kg of buffer for every 10,000 litres in the pool (assuming there is no alkalinity already existing in the water before we start).

If there is, calculate the amount of sodium bicarbonate to add as follows:

Example: If the total alkalinity reading of the pool water is 40ppm.

$$\frac{(120-40) \times 2.0}{120} = 1.3$$

Add 1.3 Kg of sodium bicarbonate for every 10,000 litres of water in the pool.

The calcium hardness needs to be about 200 ppm.

That's equal to 1.5 Kg of calcium chloride for every 10,000 litres of water in the pool.

The calcium hardness varies considerably in town water supplies all over Australia so it is best to check the calcium hardness before adding any calcium chloride.

Too much calcium hardness *can be more trouble than too little.*

Calculate the quantity of calcium chloride to add as follows:

Example: If the calcium hardness reading is 50.

$$\frac{(200-50) \times 1.5}{200} = 1.1$$

Add 1.1 Kg of calcium chloride for every 10,000 litres of water in the pool. Remember that calcium chloride crystals will adsorb water from the air (hygroscopic) so be sure to tightly seal the container after use.

After adding the chemicals allow several hours to elapse (preferably run the pump overnight) before attempting to adjust the pH.

The chemicals react with each other and also other minerals in the pool water.

The waiting time is required for the entire contents of the pool to get into equilibrium with the atmosphere. Many tonnes of water takes several hours to thoroughly mix.

Adjust the pH of the pool by adding either hydrochloric acid (liquid) or sodium bisulphate (dry pool acid). To determine how much to add-do an acid demand test. If using hydrochloric acid it is a good idea to carry acid which has been diluted with an equal part of water. This reduces the vapour pressure of the acid and eliminates the fumes. Hydrochloric acid vapours are toxic and may cause respiratory distress. Never adjust the pH of the pool with any other forms of acid.

Dry pool acid is preferred. It's much easier to carry and dispense and has no vapours. It's chemical name is sodium bisulphate not bisulphite.

Control 3 & 4 above by maintaining a residual sanitiser in the water to oxidise contaminants and kill microscopic life forms. Chlorine is compatible, bromine is not. Copper, silver and Aquabrite ensure that there is no bio-film on the pool surfaces. Ensure that the ionizer is operating correctly and that the electrodes are in good condition. They get smaller with time and will last about 2 to 3 years in the average pool.

The residual sanitiser is the combination of activated copper and silver ions and Aquabrite, as already described.

The electrodes normally take on a muddy brown colour. They do not need routine cleaning.

Only clean them if they are entirely blue-green with copper carbonate or have been allowed to dry out for several weeks.

Make up a solution of dry pool acid and warm water – about a cupful of dry acid to 4 litres of warm water in a plastic bucket.

Without unscrewing them first from either the lint filter lid or flow cell end cap, stand the electrodes in the acid solution for a maximum of 20 minutes for cleaning.

The blue solution remaining in the bucket can be poured into the skimmer box rather than wasted as it contains valuable copper and silver ions.

Hydrochloric acid solution is unsuitable for cleaning electrodes as an electrically insulating layer of silver chloride is formed on the surface of the electrodes.

NEVER use phosphoric acid, nitric acid or organic acids in a swimming pool. They are all nutrients for algae and bacteria.

RAINBOW POOL PRODUCTS PTY LTD