



## Sodium Hypochlorite

Sodium hypochlorite is the most commonly used disinfectant in NSW.

It is a liquid and has the chemical formula NaOCl.

Operators have found it easier to use and safer to handle than either chlorine gas or calcium hypochlorite.

## Chemistry

NaOCl reacts with water in the following way:

Na(OCl) + Sodium hypochlorite	H <sub>2</sub> O ----> Water	HOCl + Hypochlorous Acid	Na(OH) Sodium Hydroxide
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From this reaction it can be seen the highly reactive disinfectant hypochlorous acid is formed together with sodium hydroxide.

As the hypochlorous acid is used up through disinfection the sodium hydroxide remains, gradually increasing the pH. Pools using sodium hypochlorite tend to show a slow increase in pH over time.

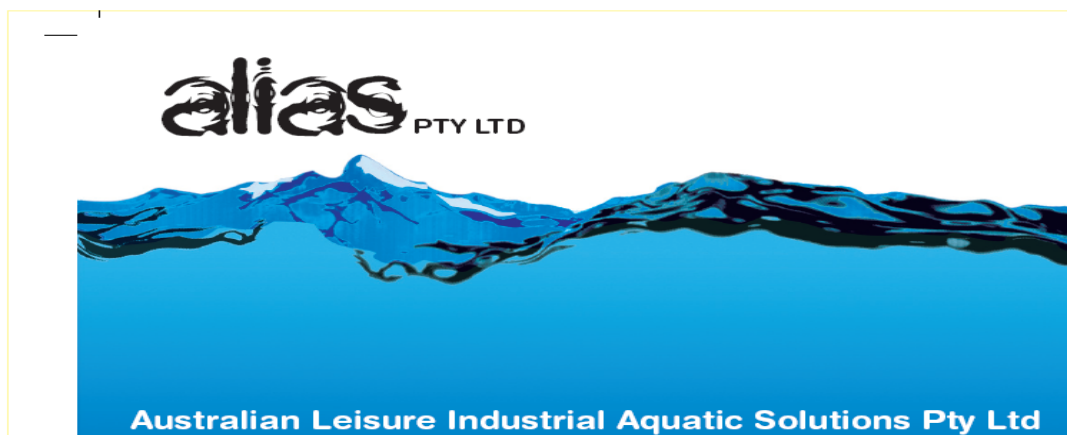
For this reason some operators may have to correct the pH by adding a small amount of either hydrochloric or dry acid periodically.

## Dosing

Sodium hypochlorite is supplied at about 10 to 14 per cent the commercial strength of the total value of chlorine. This is approximately 100 000 milligrams per litre of chlorine. The solution is added to the pool water to achieve a free chlorine residual of between 1.5 milligrams per litre and 3 milligrams per litre.

As most of the chlorine is used up disinfecting the water, it may be necessary to add many times more chlorine than is needed to achieve a simple reading of 1.5 to 3 milligrams per litre in pure water.

Chlorine is also destroyed by ultra violet light. This destruction is slowed down by the addition of cyanuric acid



The amount of sodium hypochlorite used will depend on the swimming pools characteristics and use. Some of the following conditions should be taken into consideration:

- (a) number of swimmers;
- (b) temperature/ weather;
- (c) amount of dust and dirt entering the pool;
- (d) strength of sunlight;
- (e) amount of cyanuric acid present;
- (f) how well the pool has been vacuumed; and
- (g) how well the filtration system is working

The dosing rate may require constant adjustment during the day as demand on the pool changes. If operators log the changes made with varying conditions, they will soon become familiar with the correct setting for various conditions.

Operators should aim to achieve a free chlorine residual (DPD 1. test) of 1.5 to 3 milligrams per litre through the day

The most important thing is to achieve consistent levels of 'free chlorine' (DPD 1. test) over 1.5 milligrams per litres preferably closer to 3 milligrams per litres

Increasing difficulty in reaching an adequate free chlorine reading may be because the strength of the sodium hypochlorite has decreased. If a bad batch is suspected, the supplier should be contacted.

Pools converting from calcium hypochlorite to sodium hypochlorite may have initial difficulties with slow pump speeds and vapour locks. The gas causing the problem is oxygen, formed when sodium hypochlorite breaks down. Please call for further assistance!

## **Storage and Handling**

Sodium hypochlorite is safe to store provided it is kept in a reasonably well sealed plastic container in a cool area as one of its characteristics is its breakdown in heat or sunlight. A black plastic container is recommended for this purpose.

Sodium hypochlorite breaks down very quickly if it comes in contact with metal. Operators should not allow any metal fittings to come in contact with sodium hypochlorite.



The neat strength of hypochlorite is 100 000 milligrams per litre therefore care should be taken when filling containers to avoid splashing skin or clothes.

'Full' protection (eye, clothing, gloves and breathing apparatus if required) should be worn if there is any risk of splashing when cleaning lines or pump valves.

If splashing occurs, the eye should be washed immediately with running water or with an eye bath.

Sodium hypochlorite should never be syphoned by mouth!

When necessity requires priming a pump, the line should be filled with water or some other means used.

All storage areas should be well ventilated.

For emergencies material safety data sheets should be consulted.

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