

### Upper limits

Free chlorine levels above 3mg/l should not be necessary in any pool using hypochlorite. If this is exceeded, dosing should be reduced.

If dosing has gone wrong and free chlorine reaches 5mg/l, chlorination should be stopped immediately; if free chlorine continues to rise bathing should cease until the fault has been rectified and the residual is under control.

### 9.6) Chloroisocyanurates

The same principle applies to pools on chloroisocyanurates (or with cyanurates added as a chlorine stabiliser). Chlorine residuals of up to 5mg/l may be necessary in normal operation. For pools using chlorinated isocyanurates as disinfectant, free chlorine should be maintained at 2.5-5mg/l and the cyanuric acid at no more than 150mg/l.

Some automatic controllers may not be accurate in the presence of cyanuric acid and their compatibility should be checked.

### 9.7) Combined chlorine levels

The level of combined chlorine residuals should be as low as possible. They should always be less than half the free chlorine, and no more than 1mg/l no matter what the level of free chlorine.

If this ratio of combined to free chlorine is unsatisfactory, some correction may need to be applied.

(see *Swimming Pool Water*)

### 9.8) pH value

The pH values for the pool water should be maintained within the range recommended for the disinfectant being used. But a pH value of between 7.2 and 7.4 should be the target when using chlorine-based disinfectants. At levels above this range the free chlorine will not be so effective and accordingly may need to be increased.

### 9.9) Alkalinity

To ensure effective coagulation and a stable pH when using acidic disinfectants, alkalinity in pool water should be maintained at a level between 80 and 200mg/l (measured as CaCO<sub>3</sub>).

Alkalinity measurements should be taken weekly, using commercially available alkalinity test kits and the appropriate tablets. Dilution or dilute acid should be used to lower the levels of alkalinity.

### 9.10) Calcium hardness

Pool water should be maintained for bather comfort, and grout should withstand that water. Ideally calcium hardness should be maintained between 80 and 200mg/l as CaCO<sub>3</sub>.

However, in areas with a hard water supply this cannot be practically achieved. It is therefore very important that water treatment chemicals do not further enhance