

THE SCIENCE OF SWIMMING POOL MAINTENANCE AND OPERATION

Keep your pool looking beautiful for years by following the water balance procedures recommended by your pool surface manufacturer, pool builder, pool dealer, or service company as follows:

Operate the pool's filtration system for an adequate length of time. Foliage, heavy bathing loads, screen enclosures, and rainy seasons must be taken into consideration. Under extreme environmental conditions and depending on the type of filter a good rule is:

1. Operate the filter system at least 2 hours beyond the rainy time of day. Allowing the filter to do most of the work trapping organic and inorganic matters requires less sanitizer (chlorine) and helps keep the water balanced. It also reduces the build up of by-products different sanitizers add to the pool water reducing the need for fresh water.

Diatomaceous Earth (DE) filters 8 - 10 hours

Cartridge filters 10 - 12 hours

Increased filter runs will be required under extreme environmental conditions. It is cheaper to operate the filter system than it is to correct a pool problem with chemicals. Fresh water and good filtration is the key to maintaining swimming pool water in a tropical environment.

2. Maintain water balance parameters:

Free available chlorine (FAC) 1 to 3 parts per million (ppm)

Total available chlorine (TAC) Equal to free

PH 7.2 to 7.5

Alkalinity 80 to 120 ppm

Calcium hardness 200 to 400 ppm (exposed aggregates 250 ppm maximum)

Metals 0 ppm

Cyanuric acid (stabilizer) Below 70 ppm – Above 30

Total dissolved solids (TDS) Below 1200 ppm

Note: Pools with chlorine generators should not exceed approx. 3,500 ppm TDS

Caution: High stabilizer levels inhibit chlorine's ability to work effectively, requiring higher Cl ppm levels. This results in over feeding of chlorine causing yellow and/or brown stains on the pool surface and fittings.

Make- up/fill water and water balance products contain contaminants in some form or another. Metals/minerals also make their way into the pool through the use of lawn treatment chemicals. These metals/minerals may come from your yard, neighboring lawns, golf courses, etc. Metals, as contaminants, will stain your pool if water balances are not maintained. Rain can upset the balance of pool water.

Testing - There are a variety of test kits on the market that you can purchase for a nominal cost at your local pool store. You can also use test strips but they are not as accurate. You may want to bring a water sample to your local pool supply store and have them give you a read out and give you ideas of what to add to balance the water.

High pH above 7.8, high alkalinity above 120 ppm, or high calcium levels above 450 ppm will cause a saturation problem and drive metallic contaminants from the water resulting in stains and discolorations. A good analogy would be like comparing ice tea to swimming pool water. Addition of sugar into tea can be made only to the point that the ice tea can absorb the soluble sugar. Ice tea reaches a saturation point where as more sugar is added to the tea other sugar falls to the bottom of the glass. Calcium hardness for exposed aggregate finishes should be maintained below 250 ppm. Dilution is the low cost solution! For high PH add muriatic acid as needed.

Low pH will etch the pool finish and damage the pool equipment usually resulting in pool surface stains and discolorations. Note: Be careful not to over sanitize with low pH sanitizers.

Low alkalinity allows the pH to swing up or down causing aggressive or scaling water depending on the pH of rain and sanitizers. This can result in damage to heaters and cause pool surface stains and discolorations – Add sodium bi-carb to raise alkalinity.

Low calcium hardness will create aggressive water. This can etch the pool finish as well as cause aggressive water that will strip metals out of heaters, gate valves, or any other metallic components the water comes in contact with as the pool is circulating. This too will result in pool surface stains and discolorations.

Add a Quality Sequestering Agent – The recommended product is **Scale Free** from Natural Chemistry. Your pool was started with this product and it calls for two cap fulls once per month for maintenance. This will keep any scale from forming on the finish or in the pool equipment.

Pool Perfect with Phos Free – Shake the bottle well and use one capful per week in the *skimmer* with the pool running and the skimmer on. This will remove the enzymes collected in the water from outside contaminants. It will also remove phosphates.

Phosphates – Phosphates in pool water come from many outside sources such as fertilizer from the lawn, reclaimed water for irrigation and fill or make up water. Phosphates will typically go undetected and require a separate test to find out if they are in the water. When phosphates are present, the chlorine generated from the salt system is canceled out as it enters the pool. It is very common to find a salt system in perfect working order and a pool that has turned green due to lack of chlorine, suspect number one is always phosphates. When checking pool water at the pool store ask them to run a phosphate test, or you can purchase a phosphate test kit for a few dollars. If phosphates are present, it is important to remove them right away. *Phos Free* from Natural Chemistry is the best product for removal. If you are diligent about adding one capful of *Pool Perfect Plus Phos Free* in your pool, this will not be an issue for you as it removes the phosphates on a consistent basis.

Pool water chemistry is based on scientific principles. Accurate testing and minimal adjustments must be made depending on the pool environment. There is no substitute for fresh water and good filtration when it comes to pool operation. Accurate and complete water testing regularly is essential.