

NATURAL CURRENT WATER CHEMISTRY INSTRUCTIONS

LEARN CPR
You Can Do It!

AND

View It Below

There are three principles one must understand to maintain a healthy sparkling swimming pool or spa. First, you need the Savior solar pump and filter for great circulation. By moving the water around the Savior is able to mix the chemicals efficiently and treat all the water in the pool or spa. Second, you need to remove small particles from the water; this is known as filtration with the Savior. Third, you need a sanitizer to kill bacteria and algae. **If you didn't use a sanitizer your water will quickly turn green and unhealthy for use.**

Water Chemistry -

The water in your pool or spa may look clean with the use and power of the Savior from Natural Current, but this doesn't mean it's properly balanced or safe to swim in. Proper water balance is important for several reasons. For one, good water balance means comfortable water to be in. If you've ever been to a pool and had your eyes irritated the water may have been too alkaline or the chlorine level may have been too high.

Water Test Kits

A good test kit will read total chlorine, free chlorine, total alkalinity, pH, hardness and cyanuric acid level. In addition there are specific test kits to test for the presence of minerals or metals in the water such as copper. Test strips are suggested over liquid kits because they're much easier to use and with this simplicity comes less chance of reading them incorrectly.

Calculating Your Pool's Capacity

Since administering chemicals properly depends on your pool's capacity, here are some formulas to get a close estimate in gallons.

Rectangular or Square Pools:

Length x Width x Average Depth x 7.5

(Example: A 16 x 32 pool with an average depth of 6 feet

$16 \times 32 \times 6 \times 7.5 = 23,040$ gallons)

Round Pools:

Diameter of Pool x Diameter of Pool x Average Depth x 5.9.

Oval Pools:

Length x Width x Average Depth x 5.9

Odd Shaped Pools:

If possible, divide the pool's shape into combinations of the above configurations and add them together. If this is impractical, calculate as close as possible the square footage of surface area of the pool, multiply this by the average depth and multiply this total by 7.5. If the pool has sloping sides multiply the total capacity you computed by the decimal 0.85.

Element of Water Chemistry and Sanitation

To keep pool and spa water free from algae and bacteria, you need to add a chemical sanitizer. By far the most common sanitizer for pools and spas is chlorine. When chlorine is added to the water it immediately attacks and destroys the algae, bacteria and organic solids. Ideally you should maintain a chlorine residual of 1 to 1.5 ppm (parts per million) which can be measured by using your test kit. There are four types of chlorine commonly available. Sodium Hypochlorite, Calcium Hypochlorite, Sodium Dichlor and Sodium Trichlor. Each has its advantages and disadvantages.

Sodium Hypochlorite

Essentially the same as laundry bleach, this type of chlorine is sold in liquid form at a concentration of 12 - 15%. The biggest advantage of using liquid chlorine is that it disperses into the water immediately and works fast. While it may be used for regular chlorination, most people find it inconvenient because it can easily ruin the interior of your car or clothing (like bleach) if dripped or spilled. Liquid chlorine is also un-stabilized so it dissipates rapidly in sunlight.

Calcium Hypochlorite

This type of chlorine is a mixture of calcium and chlorine. It is available in granules or small tablets and like liquid chlorine, calcium hypochlorite is un-stabilized. Because it contains calcium in its composition it will temporarily cloud that water and it will also raise the hardness. If your calcium hardness is low then using this type of chlorine will help, however if your calcium hardness is ideal or too high you should not use calcium hypochlorite to sanitize the pool.

Sodium Dichlor

It is sold in granular form and is an ideal choice for daily chlorination because it does not affect the hardness or pH of the water and is fairly strong with an available chlorine concentration of 56%.

Sodium Trichlor

This is extremely concentrated chlorine with an available chlorine concentration of 90%. The biggest advantage of sodium trichlor is its ability to dissolve slowly over time. It is sold in large tablets (hockey pucks) and can last for up to a week when dispensed in a chlorinator or floater. While this is very convenient, there are some reasons not to use sodium trichlor exclusively. First, it's very acidic with a pH of around 3.0. To counteract this extreme acidity you must add pH increaser to the pool regularly. Also, because of its high cyanuric acid content it's possible to build up too much of this stabilizer in the water. Exercise caution opening the lid of an automatic chlorinator filled with trichlor tablets because the fumes can be overwhelming.

pH -

pH is the abbreviation for "potential hydrogen" and is the measure of relative acidity or alkalinity. The pH scale runs from 0, which is a strong acid to 14, extremely alkaline. The middle point of the scale, 7, is the neutral point. Ideally you should maintain your pool water's pH between 7.4 and 7.6. Too high a pH will promote scaling, clouding, eye irritation and difficulty in maintaining the proper chlorine levels. Too low a pH will make the water corrosive and can damage liners, heaters and may even etch plaster. To raise the pH of your pool, add soda ash (sodium carbonate) If the pH is too high you should add acid (sodium bisulfate) to the water. Low pH is far more common than high pH because of acid rain, organic matter, and the use of trichlor tablets.

Total Alkalinity

Total alkalinity is the combined measurement of a group of alkaline solids in the water. It is important to maintain the level of alkalinity between 80 and 120 ppm. Failing to do so will create a condition that may cause the pH to fluctuate very quickly and make it difficult to keep at the proper level. It's a good idea to first adjust your total alkalinity before altering the pH. To raise the total alkalinity, add sodium bicarbonate (baking soda) to the water. To lower the total alkalinity use sodium bisulfate (dry acid). Raise or lower the total alkalinity of your water slowly and check it often until the desired level is attained. Note that salt-water pools have slightly different requirements in regards to alkalinity.

Cyanuric Acid

Cyanuric acid (stabilizer) helps protect your chlorine from degradation in the presence of ultraviolet light (sunlight). The use of cyanuric acid is optional. Maintain the level around 50 ppm, adding too much stabilizer will actually render chlorine less effective and it hard to remove from the water. If you use trichlor tablets to chlorinate your pool it's doubtful that you will ever have to add more stabilizer to the water.

Calcium Hardness

Calcium is one of many minerals that contribute to hard water. As far as water balance is concerned, it's the most important one to keep an eye on. Ideally you should maintain a level of 150 to 300 ppm. To raise the calcium hardness of your water, add calcium chloride. To reduce the calcium level you must drain some of the water and add new water. If you own a vinyl lined pool, do NOT drain the water more than halfway down the walls or you may jeopardize the pool's structure.

Suggested Standards - Swimming Pools

	Minimum	Ideal	Maximum
Free Chlorine, ppm	1.0	1.0-3.0	3.0
Combined chlorine, ppm	None	None	0.2
Bromine, ppm	2.0	2.0-4.0	4.0
pH	7.2	7.4-7.6	7.8
Total Alkalinity, ppm	60	80-100	180
		(for Liquid Chlorine, Cal-Hypo and Lithium Hypo)	
		100-120	
		(for gas chlorine, dichlor, trichlor and bromine compounds)	
TDS,ppm	300	1000-2000	3000
Calcium Hardness, ppm	150	200-400	500-1000+
Cyanuric Acid, ppm	10	30-50	150
			(except where limited by Health Dept. requirements, often to 100 ppm)

Suggested Standards - Spas

	Minimum	Ideal	Maximum
Free Chlorine, ppm	1.0	1.0-3.0	10.0
Combined chlorine, ppm	None	None	0.2
Bromine, ppm	2.0	2.0-4.0	10.0
pH	7.2	7.4-7.6	7.8
Total Alkalinity, ppm	60	80-100	180
		(for Liquid Chlorine, Cal-Hypo and Lithium Hypo)	
		100-120	
		(for Gas Chlorine, Dichlor, Trichlor and Bromine Compounds)	
TDS,ppm	300	1000-2000	3000
Calcium Hardness, ppm	150	200-400	500-1000+
Cyanuric Acid, ppm	10	30-50	150
			(except where limited by Health Dept. requirements, often to 100 ppm)

ALGAE CONTROL

Algae are tiny plants that bloom and grow in swimming pools if nutrients are present and a sufficient level of free chlorine is not maintained. Below are descriptions of the three most common algae problems in swimming pools.

Green Algae - The most common algae in swimming pool floats in water and coats pool surfaces. Left unchecked green algae will very quickly turn the pool water pea green.

Mustard Algae - settles on pool walls and causes a slimy yellow film.

Black Algae - appears in "buds" or clumps attached to tile grout, corners, steps and pool surfaces.

Algae Solution:

Green Algae - is very susceptible to chemical treatment. Superchlorinate with 10 to 20 ppm chlorine in the evening. Keep the filter running and brush the pool walls and bottom. Periodically check chlorine and maintain above 3 ppm until water clears. Using an algicide containing quaternary ammonia the next morning will help prevent the return of green algae.

Mustard Algae - is much more resistant to chemical treatment and clings more tightly to pool walls than green algae. Adjust pH and superchlorinate as for green algae then brush diligently. Later vacuum the pool, check chlorine and superchlorinate again if necessary. Mustard algae will generally return unless treated with a special mustard algicide or a copper based algicide. Algicide should be added in the morning to treat algae in daylight - its most active period.

Black Algae - is very difficult to get rid of. It can be controlled to some extent by frequent superchlorination and diligent brushing with a stiff brush. Spot treatments can be made by turning off the recirculation pumps and pouring granular chlorine directly on recently brushed spots. Trichlor tablets can also be rubbed on recently brushed areas to spot treat. Black algae can usually be controlled with the use of strong alicides and maintenance of relatively high free chlorine residual, but complete removal of black algae may require draining and cleaning the pool.

LEARN CPR

You Can Do It!

Have a question
about CPR?
[Click Here To Ask
The Doctor](#)

Learn CPR is a free public service supported by the [University of Washington School of Medicine](#). Learn the basics of CPR - cardiopulmonary resuscitation. The American Heart Association issued [updated CPR guidelines](#) in October, 2010.



New! Two free mobile training apps for the iPhone and Android Phones.
[Get the iPhone App Here](#) - [Get the Android App Here](#)

♥ CPR INFORMATION — Illustrated Guides Detailing CPR

[STANDARD CPR FOR ADULTS](#) - CPR in three simple steps
[HANDS-ONLY CPR FOR ADULTS](#) - CPR in two simple steps
[CPR FOR CHILDREN](#) - CPR in three steps for small children
[CPR FOR INFANTS](#) - CPR for infants in five simple steps
[STANDARD CPR POCKET GUIDE](#) - Printable CPR instructions
[HANDS-ONLY CPR POCKET GUIDE](#) - Printable CPR instructions
[CPR FOR CATS & DOGS](#) - CPR instructions for your family pet

♥ VIDEO DEMONSTRATIONS — Watch Online Videos Detailing Correct First Aid

[STANDARD CPR FOR ADULTS VIDEO](#) - Standard CPR techniques for adults
[HANDS-ONLY CPR FOR ADULTS VIDEO](#) - Hands-only CPR techniques for adults
[CPR FOR CHILDREN VIDEO](#) - CPR techniques for children
[CPR FOR INFANTS VIDEO](#) - CPR techniques for infants
[CHOKING ADULT VIDEO](#) - First aid for a choking conscious adult
[CHOKING CHILD VIDEO](#) - First aid for a choking conscious child
[CHOKING INFANT VIDEO](#) - First aid for a choking conscious infant
[FREE IPHONE APP](#) - Take the videos wherever you go free.
[FREE ANDROID APP](#) - Free training app for Android equipped phones.

♥ CHOKING INFORMATION — First Aid For Choking Victims

[CONSCIOUS ADULTS](#) - First aid for a conscious adult
[CONSCIOUS CHILD](#) - First aid for a choking child
[CONSCIOUS INFANTS](#) - First aid for a choking infant

♥ FUN AND FACTS — Games, Links And Frequently Asked Questions

[CPR FAQ](#) - Have a question about CPR? Check here first
[CPR FACTS](#) - Facts and general information about CPR
[CPR LINKS](#) - Links to other great CPR resources
[CPR QUIZ](#) - Think you're an expert? Take our quiz and test yourself
[CPR HISTORY](#) - Interested in learning about the history of CPR?
[SELF CPR?](#) - Click here to view information about this phenomenon.

This information is to be used as a free guide and an informational resource, but it cannot replace real CPR or first aid training. Please try to attend a **CPR training course** in your community and help save a life.

中文 Francais Español Русский 日本語 Deutsch

**NATURAL CURRENT | PO Box 3803, Dana Point, CA 92629 | Phone: 1-855-372-8467
E-Mail: info@naturalcurrent.com | Web Site: <http://www.naturalcurrent.com>**