Pool Encyclopedia

Algae

Algae are microscopic plants which can change the appearance and color of your water.

They find their way into the pool through airborne spores, water, grass, moss and other matter.

Algae will absorb dissolved carbon dioxide and can cause pH to rise.

There are many species of algae. There are green, yellow (also referred to as mustard algae), black and pink algae.

They can be clinging or floating. The spores that produce algae are prevented when water chemistry is maintained properly. Once algae takes hold, however, treatment becomes very necessary.

WARNING: DO NOT ALLOW SWIMMERS INTO A POOL HEAVILY POLLUTED WITH ALGAE – YOU MAY NOT SEE THEM IF THEY ARE IN DISTRESS AND SOME STRAINS OF ALGAE CAN BE TOXIC.

Algaecide

An “as-needed” chemical. If algae does occur, use an algaecide to kill the algae. Most algaecides are liquid. Once you determine the type of algae you have by color, you can add the appropriate algaecide, often in combination with pool shock. Always follow label directions.

If you have certain types of algae, especially mustard algae it will be advisable to also treat your pool equipment (brushes, hoses, vac heads and cleaners) to remove this persistent algae.

Green algae is the easiest to treat and remove, sometimes even

just shocking the pool will take care of the issue.

Algistat

Algistats are used to help prevent algae, and can be used with other chemicals to help prevent algae outbreaks. Algistats are commonly sold as preventative or maintenance algaecides, and are commonly liquid.

Using an algistat as a preventative measure once per week during the season is highly advised.

Alkalinity Increaser

Alkalinity increaser is used to raise alkalinity in your swimming pool or spa. The scientific name is Sodium Bicarbonate. Sodium Bicarbonate is typically found labeled as “Alkalinity Increaser,” “Alkalinity Up,” or “Alkalinity Plus.” Sodium Bicarbonate comes in a granular form.

Read the instructions on the label to determine the amount to add, how it must be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions.

Automatic Vacuum Cleaners

An automatic vacuum cleaner is a vacuum that will be installed on either the suction or pressure side of your pool equipment system, or as a stand-alone addition to your pool. Refer to the section on automatic cleaners for further descriptions of each type.

Automatic Water Leveler

Evaporation and splash out are the main causes of water loss in a properly functioning pool. A water leveler will add water to the pool as the system determines the water level has dropped. There are simple levelers that will hang over the

edge of the pool attached to a garden hose, or there are options taht can be added into the equipment system.

Backwash Hose

A backwash hose is needed when there is a multi-port or push pull valve present to waste or backwash water from the swimming pool system. These are most common with sand filter and DE filter systems.

Some areas restrict the use of filters that require the backwash function. If you have a pool system with a cartridge filter it is unlikely you will have a backwash hose.

Backwash hoses are commonly blue flexible hose attached to the multiport, or it can be hard plumbed into a drain system or use pvc or flex pipe to send water away from your pool.

Bromine

Bromine is in the same halogen family as chlorine. It does have its advantages and disadvantages. Unlike chlorine, it cannot be stabilized with a product such as cyanuric acid. This is a problem with outdoor pools since the sun will quickly burn off the bromine. Bromine would need to be constantly added which would become costly. It is dosed into the pool by means of a circulatory feeder.

The main reason that bromine is not chosen as often as chlorine, is that it is fairly expensive. Bromine’s niche is with spas (hot tubs), as it is more stable than chlorine in the hotter water temperatures.

Brush

Typically, a pool brush is 18″ in length and has either nylon bristles or stainless steel bristles. Nylon bristles are safe for all pool types, stainless steel bristled brushes should only be used on gunite swimming pools.

Brushes are used to brush the pool walls and floor to remove debris, and algae.

Specialized brushes can come in many shapes and sizes.

The nylon bristle brush can be used with any type of pool to brush away dirt, debris, or Green & Mustard Algae. The stainless steel bristle brush can only be used on a concrete, gunite, shotcrete, or fiberglass pools to remove stubborn Black Algae, stubborn dirt, and any stains or scale. A stainless steel bristle brush can never be used with a vinyl-liner pool (it is too abrasive and may tear the liner).

Calcium Hardness

This is the amount of dissolved calcium (plus some other minerals like magnesium) in the water. Too much calcium in your water will cause cloudy water and scaling, which is a white chalky deposit that will form on pool surfaces, and inside equipment of pumps, heaters and salt cells.

Too little calcium in the water will contribute to water becoming aggressive and can etch and corrode the pool surface and metal components of the pool and equipment.

Calcium Hardness Increaser

Calcium Hardness Increaser is a chemical used to raise the hardness in a swimming pool or spa. It’s scientific name is Calcium Chloride. You will find this commonly packaged and labeled as “Hardness Increaser,” “Hardness Up,” or “Hardness Plus.”

Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or broadcast straight from the container), a maximum amount (per 10,000 gallons of water) that can be added at one time, and other precautions. Caution: adding calcium hardness increaser to water causes a reaction and water to become hot. Be careful not to mix in a container and touch the container, or touch

the contents as a burn may occur.

Note: There is not a common product that is packaged and sold as a Hardness Decreaser, though there are some chemicals that will bind calcium in the water to lower levels that way. The best option, if your Hardness level is too high will be to drain some of your pool water and refill, and rebalance your chemical levels.

Calcium Hypochlorite

Calcium hypochlorite is a form of chlorine available that comes in granules or tablets. It is not stabilized, which means it will produce 65% available chlorine and be relatively fast acting. It tends to raise the pH.

Cement

A powdery substance made with calcined lime and clay. It is mixed with water to form mortar or mixed with sand, gravel, and water to make concrete, and is used as a building component in gunite swimming pools, as well as faux rocks and carved components, especially found in Legendary Escapes swimming pools.

Chlorine – Cl2

Chlorine is the most widely used chemical for swimming pool sanitizing. It kills bacteria through a chemical reaction which breaks down chlorine into hypochlorous acid and hypochlorite ions, which oxidize bacteria until they are either neutralized or destroyed.

Chlorine dissolves in water to form hypochlorus acid (HOCl or free chlorine – the principal water sanitizer) and hydrochloric acid.

Used at proper levels chlorine kills bacteria, living organisms, ammonia, and any other contaminates (such as dirt, debris, and algae spores) that are in pool water.

The two most common forms of chlorine used are granular chlorine (whose scientific name is “Dichlor”) and chlorine tablets (whose scientific name is “Trichlor”). Chlorine tablets come in two sizes: 1″ tablets and 3″ tablets, as well as sticks.

Advantages of chlorine:

It has a long half life, and can be stored in solid form for a long time.
It comes in different forms
It has a residual effect, and will neutralize contaminants when first added, and over time.
Concerns:

Byproducts are chloramines and can cause skin and eye irritation

If you rely on chlorine for sanitizing your pool you should have a steady level of 1.0-3.0 ppm (parts per million) of chlorine in your pool.

You can add this in several ways. You can install an automatic chlorinator that takes tablets, either 1″ or 3″ that are added to your water as it flows through your system.

You can add liquid chlorine (which is the fastest acting version of chlorine, it is also the most quickly used up by your pool).

You can also add granular shock chlorine products to the pool, or in some cases use a floating chlorine dispenser. The rule of thumb for adding chlorine is 1 bag of shock or gallon per 10,000 gallons of pool water.

You can adjust and add more if the pool is green or cloudy. At openings we typically add 1 case (4 gallons) of liquid chlorine to all pools, and 2-3 cases for low water clarity, green, or in general really dirty/algae filled pools.

Another popular option is to install a chlorine generating cell/salt system to your pool. This uses regular salt, the cell converts the salt into the sodium and chlorine atoms, and the chlorine sanitizes your pool. It will then convert back into salt and maintain a healthy level in the pool until it is converted again, and helps to keep the pool clean.

Chlorine Alternatives

There are numerous chlorine alternatives on the market including bromine, Bacquacil, Revacil, (peroxide shock and polyguinide plastic polymer chain that will bind contaminants in the water and destroy them) mineral systems, chlorine generators (which produce chlorine from salts), iodine, and flourine.

Over 90% of pool owners use chlorine or bromine (with the dominant percent still being chlorine).

The Pool Guy advises using chlorine or a salt generating system when possible. Individuals with sensitive skin or reason not to use chlorine are encouraged to look into alternative sanitizing systems.

Chlorine Demand

The amount of chlorine needed to destroy pollutants in pool water such as bacteria, algae and other contaminants.

Chlorine Donor

One of the many chlorine compounds available which, when dissolved in water, will provide chlorine or hypochlorus acid.

Chlorine Lock

Over time as stabilizer stabilizer (cyanuric acid) builds up in the water, it can attain levels that bind to chlroine and lock the chlorine. This makes it difficult for the dichlor or trichlor to react with the water and produce sufficient

hypochlorus acid (free chlorine) to kill bacteria and other micro-organisms. This may happen in areas where pools are not drained and refilled for the winter/spring closing and opening cycles, and when stabilized chlorine is used, or an over abundance of cyanuric acid is added or present in water.

The solution to lowering the stabilizer levels is to drain and refill some of the pool water.

Chlorine Residual

The amount of chlorine left over after the chlorine demand has been met, it is what is left over after the chlorine has killed organic matter in the water.

Chlorine Stabilizer

The chemical name is cyanuric acid. It is also commonly referred to as stabilizer or conditioner.

It can be obtained as a granular product. It is also found in stabilized chlorine (and will be labeled as stabilized chlorine) often in dichlor or trichlor form. When stabilized forms of chlorine are mixed with water they dissociate (split up) into hypochlorus acid (free chlorine) and cyanuric acid (stabilizer).

Suggested levels of stabilizer are beneficial because they prevent wastage of free chlorine by the u/v waves in sunlight, but high levels are a disadvantage because they make it take longer for the chlorine to kill micro-organisms and can cause chlorine lock.

If you are using dichlor or trichlor, there should be no need to add extra stabilizer.

If you sanitize your pool with sodium hypochlorite or calcium hypochlorite which have no inbuilt stabilizer you will need to add some.

DANGER: do not mix these chemicals in the dry state.

Clarifier

An “as-needed” chemical used to clump smaller particles into larger clumps so the filter can remove them.

If you experience cloudy water it may be because of particulate in the water (bacteria, dirt, and other debris) that are suspended in the pool water. These particles are so small that the filter cannot trap them, unless they bind together in larger amounts.

Clarifiers are typically liquid, and the chemistry of what is in them is not often disclosed, other than it is typically a blend of polymers of some type. Clarifiers are often used with shock to restore water clarity.

Combined Chlorine Or Chloramines

When free chlorine reacts with nitrogen compounds which are introduced into pool water by swimmer pollution, combined chlorine or chloramines are formed which break down into ammonium compounds (hence, chlor + amine).

Combined chlorine and chloramines are ineffective as sanitizers, and nitrogen trichloride is the cause of the stale chlorine smell associated with public swimming pools.

Chloramines are broken down by raising the level of free chlorine through a shock process which will reach break point chlorination (enough free chlorine present to break the combined chlorine bonds.)

Cover Cleaner

Solar Cover Cleaner –

A cleaner used to clean off your solar cover.

To clean your solar cover, lay it out, spray it with a garden

hose, and brush, use your cleaner and rinse.

NOTE: Take care when laying your cover on grass. The sun can quickly penetrate the cover and burn your grass.

Winter Cover Cleaner –

A cleaner used to clean off your winter cover. A garden hose and brush can be used with our without cover cleaner.

NOTE: Take care when laying your cover on grass. The sun can quickly penetrate the cover and burn your grass.

Cyanuric Acid

Cyanuric Acid, often referred to on the label as either “Conditioner” or “Stabilizer” will protect chlorine from being destroyed by the sun.

Chlorine in the form of free chlorine is susceptible to being destroyed by the ultraviolet rays of the sun. The cyanuric acid acts as an inner tube of sorts that chlorine can hang on to so when the sun hits it, it will stay in the water.

Some granular chlorine and all stabilized chlorine tablets contain Cyanuric Acid.

Cyanuric acid levels should be checked periodically throughout the season and adjusted as needed. Cyanuric acid often takes a long time to dissolve, should be added gradually, and will increase filter pressure and should not be backwashed for at least 48 hours.

Cyanuric Acid is NOT used with Bromine or any other of the alternatives to chlorine.

DE

DE or diatomaceous earth is an effective filter media made up of fossilized diatoms which are porous microscopic spongelike organisms. DE coats the grids inside of a DE filter and traps

particles, which will then be dislodged when the filter is backwashed and cleaned, and a new coating of DE will be applied.

Defoamer

Defoamer is liquid that can be sued to eliminate foam from pool or spa water. It is most commonly used in spas. Foam is caused by total dissolved solids, a byproduct of chemicals used, and body oils, lotions and shampoo or detergent products.

Dichlor

Dichlor is short for the chemical name of sodium dichloroisocyanurate dihydrate.

This is one of the stabilized chlorine donors (trichlor is the other.) It is called dichlor because there are two atoms of chlorine bonded to nitrogens on the molecule (sodium is bonded to the third nitrogen) trichlor has three.

Dichlor is usually packaged in granular form with 55% available chlorine.

When dissolved in water, it dissociates (splits up) into hypochlorous acid (free chlorine) and cyanuric acid.

Enzyme Cleaner

Enzyme cleaners are liquid form and can be used to breakdown and eliminate the dirty water line (also called the water ring or scum ring) that often forms around the top edge of swimming pools on the tile line, from fluctuations in the water level.

Products such as suntan lotions, underarm deodorants, and women’s make-up, as well as body oils & dirt, can attach to the pool walls (just above the surface of the water) to cause this water line.

The Enzyme cleaner will react with the contaminants and break

them down into liquid form to eliminate this water line.

Read the instructions on the label to determine the amount to add, how it should be added (most manufacturers of Enzyme cleaners recommend pouring it straight from the bottle), and other precautions.

Foam will often appear immediately after adding an enzyme cleaner. This signals the enzymes are reacting with the water line contaminants.

FerriTabs

Ferri-Iron Tabs are swimming pool water treatment tablets that help eliminate the discoloration caused by iron and manganese. They have been formulated for use in all filters (see package labels).

These double-action tablets are formulated to help decolorize water that has been colored by IRON or MANGANESE. These discoloring insoluble materials are removed from the water by charge neutralization and flocculation.

This non-toxic formulation is completely soluble in water and contains no caustic or corrosive chemicals, diatomaceous earth, alum, or any chemicals that will alter the pH or chlorine level of the water.

Make sure pool water has a pH of 7.2-7.6, and contains a measurable amount of chlorine by adjusting with chemicals as necessary. Chlorine will not effect the Ferri-Iron Tab action on Iron or Manganese. Make sure the pool filter is in good operating condition and has been turned on.

Drop 1 tablet for each 3000 gallons of pool water into the skimmer basket. In large pools that have multiple skimmers distribute the tablets.

For best results, add the required tablets over a period of a few hours, while the filter is operating. In order to

permanently improve the water quality, the filter must be thoroughly back-washed within 18-24 hours after treatment.

In pools that have severe problems, repeat dosage and back-wash procedures after 24-48 hours.

In order to prevent a recurrence, when adding make up water, add 1 tablet for each 3000 gallons or less of fresh water.

Ferri-Iron Tabs can be shipped anywhere in the United States and most other countries.

Filter Cleaner

Filter Cleaners do not have a direct effect on water chemistry. They clean the filter, which does have a direct effect on water chemistry.

Filter Cleaners can be liquid or granular.

Purchase the specified Filter Cleaner for your type of filter.

Note: since Filter Cleaners are less of a chemical and more of a cleaner, it is okay to pour a Filter Cleaner in the skimmer. It is NEVER recommended to pour or place any chemical in the skimmer.

Garden Hose Operated Vacuum

Some pools do not have suction lines in order to vacuum the pool with a manual vacuum assembly and so a garden hose operated vacuum is used.

There are two types of vacuum units: the brush-style vacuum unit and the wheel-style vacuum unit.

The brush-style vacuum unit is used for vinyl-liner pools. The wheel-style vacuum unit is used for concrete, gunite, shotcrete, and fiberglass pools.

Your standard garden hose will attach to the vacuum unit. The

running water from your garden hose will create suction, drawing the leaves, dirt, and other debris into the silt bag of the vacuum unit. Once full, empty the silt bag, reattach it to the vacuum unit, and start again until the silt bag is full, etc. until you’re done.

Many pool owners with the capability to use a manual vacuum assembly will also have a hose operated vacuum.

If there is an enormous amount of leaves and other large debris on the pool floor it may be too much to net out or manually vacuum.

Gunite

Before we get into that, the photo above is of a gunite pool in Highland, MI built by Legendary Escapes. The pool was formed, and then shot in gunite, as was the base for the waterfall that you see in the background. The gunite surface was then finished with pebble. Sometimes a white marcite coating, pebble, or quartz will be used to seal the gunite surface.

Shotcrete is concrete (or sometimes mortar) conveyed through a hose and pneumatically projected at high velocity onto a surface, as a construction technique.

Shotcrete is usually an all-inclusive term; gunite is a term sometimes used for some dry-mix types.

Shotcrete undergoes placement and compaction at the same time due to the force with which it is projected from the nozzle. It can be impacted onto any type or shape of surface, including vertical or overhead areas.

Shotcrete, then known as gunite, was invented in the early 1900s by American taxidermist Carl Akeley, used to fill plaster model of animals. He used the method of blowing dry material out of a hose with compressed air, injecting water at

the nozzle as it was released. This was later used to patch weak parts in old buildings. In 1911, he was granted a patent for his inventions, the “cement gun”, the equipment used, and “gunite”, the material that was produced. Until the 1950s when the wet-mix process was devised, only the dry-mix process was used. In the 1960s, the alternative method for gunning by the dry method was devised with the development of the rotary gun, with an open hopper that could be fed continuously. Shotcrete is also a viable means and method for placing structural concrete.

Shotcrete is today an all-inclusive term that describes spraying concrete or mortar with either a dry or wet mix process. However, it may also sometimes be used to distinguish from gunite as a wet-mix. The term shotcrete was first defined by the American Railway Engineers Association (AREA) in the early 1930s.[1] By 1951, shotcrete had become the official generic name of the sprayed concrete process.[1]

Gunite refers only to the dry-mix process, in which the dry cementitious mixture is blown through a hose to the nozzle, where water is injected immediately before application. Gunite was the original term coined by Akeley, trademarked in 1909 and patented in North Carolina. The concrete is blasted by pneumatic pressure from a gun, hence “gun”-ite.

The term “Gunite” became the registered trademark of Allentown, the oldest manufacturer of gunite equipment. Other manufacturers were thus compelled to use other terminology to describe the process such as shotcrete, pneumatic concrete, guncrete, etc. Shotcrete emerged as the most commonly used term other than gunite, and after the later development of the wet process came to be used for both methods.

And that is what you need to know about gunite, shotcrete and concrete.

Hard Water

Water is considered hard if its calcium hardness is over 250 ppm and its alkalinity is over 150 ppm.

Hybrid Swimming Pool (TM)

A Hybrid Swimming Pool (TM) is a combination of the elements of a gunite pool with a vinyl liner pool, developed by Allan Curtis of Legendary Escapes in the Michigan market.

It can be described as a pool with a basin created using both technologies of vinyl liner and gunite. Vinyl is comfortable for swimmers and gunite allows the designer freedom with shapes, sills, slides, waterfalls, grottos, swim-up bars/tables, ceramic tile lines and more. Where vinyl meets gunite is where the magic of this dual personality pool comes together. The final look is seamless.

The building of hybrid swimming pools has been pioneered by Al Curtis {Ask the Pool Guy} of Legendary Escapes. Curtis has revolutionized the swimming pool industry with this new design and construction technique, resulting in artistic and creative combination pools.

Hypobromous Acid (Free Bromine)

Hypobromous acid or free bromine is the main disinfectant in pools on bromine or BCDMH. It is formed (a) by dissociation when BCDMH is dissolved in water and (b) by the reaction between hypochlorus acid and spent bromine (bromide ion). It is commonly used in spas and hot tubs as it is effective over a much wider range of pH values and at higher temperatures.

Hypochlorite Ion (OCl)

The is chlorine resulting from dissociation (splitting up) of hypochlorus acid (HOCl) into its constituent parts – H+ and OCl- (hypochlorite ion).

This will happen if the pH of the water is high.

If the pH is too low the hypochlorus acid dissociates into molecular chlorine (CL2).

The hypochlorite ion is a poor disinfectant because the negative charge creates an obstacle to penetrating the wall of the cell. Hypochlorus acid is 100 times faster than hypochlorite ion in killing a micro-organism.

Hypochlorus Acid – HOCl

Also known as free chlorine, it is formed when calcium hypochlorite, dichlor, trichlor or chlorine gas are mixed with water and dissociate. This is the main pool water disinfectant.

Hypochlorus acid acts (a) as a sanitizer killing potentially harmful bacteria and micro-organisms (it can enter a cell's wall and upset its protein and enzyme function), (b) as an oxidizing agent eliminating organic and inorganic impurities by a process similar to combustion e.g. it burns out pollution introduced by swimmers such as sweat and urine (yes, I'm afraid people do).

Useful amounts of hypochlorus acid can only be obtained if the pH is within certain limits or if the stabilizer level is not too high.

Ionization

Ionization is the process in which a current is supplied to a sacrificial electrode made of various metals and subatomic particles ions are pulled off and pass through a stream of running water which neutralize disease causing organisms.

The metals can be copper, copper/silver, or copper/zinc.

These metals are toxic to many types of bacteria and algae. Pool ionization is not a stand-alone sanitizer and additional

sanitizing, often by chlorine is needed.

In-Floor Cleaning System/In-Floor Heating & Efficiency

In-Floor cleaning systems have low profile fixtures that pop-up automatically (driven by the system) to move debris to the drain and out of the pool. They also are more efficient for heating the pool, as the jets are located on the bottom of the pool resulting in heating from the bottom up.

Langlier Saturation Index

Langelier Saturation Index (LSI) is a calculation for a pool or spa. The LSI assesses the overall balance of the water. If you are interested, you can find an online source for "Langelier Saturation Index Calculator." Enter your readings and you can determine whether your water is corrosive, balanced or scale-forming. Note: you must enter all parameters to calculate this index correctly.

Manual Vacuum Assembly

This typically consists of a vac head for your pool type, the vacuum hose, the vacpole, and perhaps a vacuum seal plate for the skimmer.

There are two styles of vac heads: the brush-style vac head, often triangular in shape for use in a vinyl liner pool, and the wheel-style vac head, typically rectangular in shape for use in gunite and fiberglass pools.

One end of the vacuum hose connects to the vac head (the end that swivels) and the other to your skimmer. Do not mix these up, as you may introduce air into your system if the end that swivels is in the skimmer and prevent the system from priming properly.

If needed a vacuum seal plate should be placed over the skimmer in order to trap debris in the skimmer basket, and for the best suction.

Some pools are built with a designated vacuum line for the end of the vac hose.

Use your telescoping vacpole to maneuver the vacuum assembly across the pool floor and walls.

Metal Sequestering Agent

Metal Sequestering Agents can either be liquid or granular and are used to treat odd tints to the color of the pool water, stains, or the formation of scale. These colors and stains may result from the minerals that are present in the tap water that is used to fill the pool (such as copper, iron, manganese, magnesium, or calcium) or from poor water chemistry and leeching from pool equipment and surfaces.

If an odd tint, any stains, or the formation of scale are present, the condition can often be remedied by correcting and maintaining proper water chemistry and by using a Metal Sequestering Agent, which will rid the water of these excess minerals.

Read the instructions on the label to determine the amount to add, how it should be added (either diluted in water or poured/broadcast straight from the bottle/container), and other precautions.

Muriatic Acid

Muratic Acid can be used to lower pH and Alkalinity, as well as for cleaning tile and guinte pool surfaces. It can be added directly to swimming pool water, and poured directly on tile and gunite surfaces to release surface staining. It is also used during acid washes, with a metal bristled brush to etch the surface of gunite, pebble and marcite to release surface stains.

Muriatic acid is in liquid form. Some forms are sold with additives to reduce the odor and accidental exposure to the elements which cause irritation.

NOTE: Be extra careful when handling muriatic acid. It is highly corrosive and can react chemically with normal clothing. The fumes are also dangerous and can damage your respiratory tract and linings of your organs, wearing a mask for fume inhalation prevention is advised, as well as gloves and safety goggles.

Nets

There are two styles of standard pool nets:

The deep net, which is often called a leaf rake, has a wide opening and a bag shaped net. This style of net is primarily used to reach leaves or other large debris that have settled to the pool floor. The deep net can also be used to skim leaves and debris off the surface of the water, but the skimmer net is best at performing this task.

The skimmer net, which has a shallow net, is primarily used to remove leaves, grass clippings, debris, or insects that float on the surface of the water.

Ozone

Ozone generators are found in many commercial swimming pool systems, as an additional treatement for water. They ozonate water in pipes, and no ozone enters the pool. Ozone is a gas that is produced by ultraviolet light exposure to oxygen. It is injected into water, and will kill bacteria present.

Ozone is not an alternative to chlorine or the primary sanitizing method in a pool. It is meant to supplement as an additional treatment.

Ozone is most common in spas and hot tubs, and works effectively with both chlroine and bromine sanitizers.

Ozone kills bacteria and certain organisms which can cause illness, more effectively than chlorine. It also prevent airborne endotoxins, as well as oxidize and destroys oils and

other water contaminants.

Ozone is pH neutral and adds no contaminants into water.

Parts Per Million (ppm)

Equivalent to milligrams per liter (mg/l). The standard way of quantifying the amount of chemicals or minerals in the water.

For an idea of scale, 1 ppm is equal to 1 milligram per liter. So, 5 ppm is 5 milligrams for every liter of water. Or a 5/1,000,000 ratio.

pH

pH is the measurement of acidity of water and measured on a scale of 0 to 14 with 7 being neutral (water).

A pH below 7.0 means the water is very acidic, as the pH approaches 8.0, the water becomes very basic (alkaline).

Proper pH levels allow the other chemicals to work properly, and keep an optimal balance in water chemistry. Low or high levels can cause damage to a vinyl liner.

Under the right circumstances, with pH below 7.0, the liner can actually grow and develop unsightly wrinkles. We refer to those as pH wrinkles. There is no way to remove them besides installing a new liner. High pH greatly accelerates the aging process and shortens the life of the liner, and will often cause cloudy water and surface scaling.

Chlorine is less effective at higher pH levels. At a pH of 8.0; chlorine is only 22% effective.

Use pH+ or pH- to adjust the pH of your water. Always address the Total Alkalinity level first as it can cause the pH level to fluctuate.

pH Decreaser

Used to lower pH and Alkalinity. The scientific name is Sodium Bisulfate and is typically packaged and sold as “pH Decreaser,” pH Down,” or “pH Minus.”

Sodium Bisulfate is granular and is commonly referred to as “dry acid” (as opposed to the liquid Muriatic Acid, which is an alternative to lowering pH and Alkalinity).

Note: Sodium Bisulfate is also used to lower Alkalinity. There is no product that is packaged as an “Alkalinity Decreaser.”

pH Increaser

Used to raise pH. The Scientific name is Sodium Carbonate and is typically packaged and sold as “pH Increaser,” “pH Up,” or “pH Plus.” Sodium Carbonate is granular.

Pool Filtration System (Example)

Pool Filtration Diagram

ppm

See: Parts Per Million.

Salt System or Chlorine Generator or Generating System

Salt generating systems use salt added to pool water, run through a chlorine generators which break the salt into sodium and chlorine.

The chlorine cleans your pool and clears the water; then, when the chlorine has done its job, it hooks back up with the sodium and turns back into salt.

The salt is recycled continuously, day after day and this system provides a continual release of the chlorine sanitizing agent into your water.

Note: A salt water pool will conduct trace amounts of

electricity, resulting in electrolysis potential in your pool. A zinc anode protects the metal components of your swimming pool from corrosion. The zinc anode will be the first thing to corrode, saving the other parts of your pool from corrosion. If you have a salt pool make sure you have a zinc anode. They are often overlooked, and are a critical part of your system!

Shock

Shock is often referred to as the act of shocking a pool, and the substance used to superchlorinate or shock and oxidize a pool. Shocking a pool should happen at least once per week, and as needed during the pool season.

Shock can come in a granular form in both chlorine and non chlorine forms, and is also often used as a term for liquid chlorine.

If you use chlorine to chlorinate your pool you will want to predominantly use a chlorine-based shock (such as Calcium Hypochlorite or Lithium Hypochlorite).

If you use an alternative to chlorine sanitizing such as a non-chlorinating method like Baquacil or Revacil, you need to use their specific shock products.

If you use bromine, you will want to predominantly use a non-chlorine shock (such as Potassium Peroxymonosulfate). You can supplement your shock schedule with a chlorine-based shock periodically.

No, neither a 1910 bathing costume or tiny polka-dot bikini will shock your pool.

Shock Chlorine

Usually a short-hand way of referring to sodium hypochlorite or calcium hypochlorite, which can be dosed into the pool at a high rate, without increasing levels of stabilizer (cyanuric acid).

The purpose of shock dosing is to achieve breakpoint chlorination, and to increase the amount of free available chlorine to combined chlorine or chloramines in your pool.

It can also be used as treatment for a problem such as algae growth, cloudy water or unpleasant chlorine smells.

It does this by satisfying chlorine demand i.e. by killing bacteria, algae, and other micro-organisms, and breaking down accumulated organic impurities to leave a chlorine residual.

Shotcrete

See Gunite

Soda Ash

An alternative to raise pH. Like Sodium Carbonate (pH Increaser), Soda Ash is also granular.

Soft Water

Water is considered soft if has a hardness of under 50 ppm as calcium carbonate and an alkalinity of under 30 ppm as calcium chloride. The pH can be rather unstable in soft water areas, but alkaline chlorine donors such as calcium hypochlorite will help to increase hardness as will the addition of calcium chloride.

Superchlorination

Superchlorination is often interchanged with the term shock or shocking a pool.

Superchlorination is commonly used to raise chlorine levels to around 10 ppm to prevent bacteria or algae infestation and can be used to reach breakpoint chlorination.

Testing – Testing Kits and Routines

You must constantly test for chlorine (or its alternative), pH, and Alkalinity at the poolside.

Approximately once per month, or if unusual pool readings occur, take a water sample to your local pool professionals and have them test every chemical reading on the computer.

Test chlorine (or its alternative), as well as pH and Alkalinity, 2 – 3 times per week during normal weather conditions and under normal use.

Test chlorine (or its alternative) daily during periods of scorching temperatures, unbearable humidity, and intense sunlight, as well as times when swimmer load is at its highest.

Test chlorine (or its alternative), as well as pH and Alkalinity, after heavy rainfall, before and after a pool party, and, of course, if water appears to be cloudy, murky, or beginning to form algae.

The only way that you can accurately determine your water chemistry is by testing. You cannot count on a visual test to indicate the appropriate levels.

Tile & Vinyl Cleaner

A cleaner to clean the walls (and tiles, if applicable) of concrete, gunite, shotcrete, or fiberglass pools, and to clean liners of vinyl-liner pools.

This product is fairly effective for eliminating light dirt, discolorations or stains. The product is safe to mix with your pool water when used with manufacturer instructions.

Total Alkalinity

Closely related to pH, it is the first chemical to adjust, prior to making a pH adjustment as it buffers the pH changes in the water.

Total alkalinity is a measure of the amount of alkaline materials in the water. This alkalinity will usually be

present as bicarbonates, but with a very high pH carbonates and hydroxides can be present as well.

Alkalinity is a measuring of the alkaline materials dissolved in water. With the alkalinity in the range of 100 to 150 ppm, it helps pH to resist fluctuations. If the alkalinity is low the result is that the “pH will bounce” in and out of range.

The relevance to pH is that the amount of alkali (hardness) in the water will determine how easy it is for changes in pH to occur.

If the alkalinity is too low (below 80 ppm) there can be rapid fluctuations in pH – i.e. there is insufficient ‘buffer’ to the pH. High alkalinity (above 200 ppm) will result in the water being too buffered – it will make it difficult to adjust or correct the pH.

Pools with an alkalinity problem often coupled with a pH problem will see issues with the heater core. When these are out of balance water becomes aggressive, and will corrode the inside of your heater core (which contains copper – so if you have copper in your water and have no other source, it’s most likely from your heater). If this happens, you want to remedy your water balance problem quickly and you may need to replace your heater core, or in some cases, the entire heater.

High alkalinity and high pH can lead to cloudy water and scale formation. Low alkalinity can result in corrosion and discomfort to swimmers.

Total Chlorine

Free chlorine plus combined chlorine. Hence chloramine levels can be worked out by the formula: Combined chlorine = total chlorine (from DPD no 3 tablet) – free chlorine (DPD no 1 tablet).

Total Dissolved Solids (TDS)

As a measurement of the total amount of matter (minerals, chemical residue, dust, dirt, and other particles) that are dissolved in water.

Water can only absorb so many components. When TDS becomes too high, the water cannot absorb chemicals, and will render them ineffective.

The best way to control TDS is backwashing and refreshing of water in a swimming pool. In southern states where pools are not drained and refilled during opening and closing times, the TDS may become out of balance. Evaporation will also allow solids left behind to add up in the balance of the water.

The highest level of TDS for a pool is 1,500 ppm. However, salt systems will need to measured considering the salt ppm separately from the TDS measurement.

At values above 1500 ppm we begin to notice stains in the pool. It will also reduce the activity of any chemicals you add, preventing them from doing what they’re supposed to. The water may also become cloudy.

As water evaporates, only the water itself evaporates. Minerals, chemical residue, and other particles are left behind and remain in the pool water. With evaporation, you need to continually add water. As you add tap water up to the standard operating water level (half way up the skimmer), you are also adding additional minerals and particles. Although these minerals and other particles from tap water do add to the TDS reading, it is extremely minimal.

The biggest factor is that this new tap water will soon be introduced to chemicals. It is the chemical residue that is not filtered and remains in the pool water that has the greatest effect on increasing TDS. Whenever chemicals are added, the TDS reading will increase.

Eventually, this matter that remains in the pool water will act as a sponge, consuming your new chemicals, rendering them virtually ineffective. It will take many years (approximately 6-8 years) for the TDS reading to become so high that it will consume your chemicals before they can engage in their intended purpose. (6-8 years is a guideline only.)

There is no chemical that can lower the TDS reading into an ideal range. Rather, a TDS reading can only be lowered by draining your pool, either partially or completely, and adding fresh water.

If it has been some time since your pool was last drained and cleaned, there are certain indicators that may tell you that your TDS reading is contributing to water balance issues:

Continual addition of excess chemicals.
Water chemistry tests fine, but water is still not clean, clear, blue and sparkling.
Various water chemistry problems include:
Colored yet clear water (the water has an odd tint, but you can still see the pool floor).
Algae growth despite a good chlorine (or its alternative) reading and proper overall water chemistry (pH and Alkalinity).
Varying and false readings on chemical tests.
If any of these are the case with your pool, or if other water chemistry issues are present, we suggest you have your TDS tested and correct the issue appropriately.

In a salt pool, where the salt is dissolved in the water and is set to run at between 3500 ppm and 4000 ppm, the salt concentration needs to be omitted from the TDS measurement.

Trichlor

Short for trichloroisocyanuric acid – a bit easier to say than the chemical name for dichlor. This is a stabilized chlorine donor. It is called trichlor because there are three atoms of

chlorine bonded to the nitrogens on the molecule. This makes it stronger than dichlor which only has two.

Usually sold in the form of slow dissolving tablets of 91% available chlorine. When dissolved in water, trichlor dissociates (splits up) into free chlorine and cyanuric acid.

UV Ozone Generators

UV Ozone generators use Mercury to create Ozone, and are commonly used as secondary systems in commercial pools and in hot tubs and spas. Ozone is a powerful oxidizer, it neutralizes contaminants in swimming pools by releasing oxygen atoms which combine with algae, bacteria and oils to change or destroy them. Ozone has no effect on pH levels of swimming pools. An ozone generator can only be used as a secondary system, and a main sanitizing method must be used.

Vacpole

A long aluminum pole that can extend to various lengths in order reach all areas of the pool.

It is a multi-function tool that will attach to nets, brushes, vacuum heads, and other maintenance equipment. It will also attach to the “Shepherd’s Crook,” which is a life-hook (a life-saving device).

Water Balance

Water balance is the balance of the chemical make up of water.

All water, tap water, bottled water, and pool water have minerals in them. Your pool needs a specific balance to be safe and balanced.

Zinc Anode

A zinc anode is a critical part of your salt water swimming pool system. It becomes the sacrificial metal for trace electrical charges in the water and was designed to stop metal

erosion and plaster discoloration due to galvanic corrosion. There are many options for zinc anodes including skimmer discs, ladder and light bolt on options, and anodes to be plumbed in at the equipment pad.

Zoo

Consider posting your pool rules and enforce them or you will have one, a Zoo that is. Here are some things to consider:

No sharp objects in and around the pool.
No glass containers in the pool area. Broken glass is very hard to see in the water and will cut your vinyl liner, if you have one, as well as swimmers.
No diving – unless your pool was designed for it.
No pushing – not everyone can swim and they may hit something harder than their head.
Children should take frequent toilet breaks and clean up well. Wash hands. (Really.)
Swimming Babies – It’s never too early to learn – yet even a small amount of fecal matter can make another swimmer sick. Be sure the child is clean before entering the pool. Everybody out, if there is an incident. (Note: Swim Diapers are no guarantee of containment.) Also, change diapers in a bathroom or a diaper-changing area and not at poolside.
No swimming for someone who is sick, especially when they have diarrhea. They can spread germs in the water and make other people sick.
(Ladies, it’s fine with internal protection.)
Swimsuit required? (Please consider your neighbors.)
Bathing Cap required?
No swimming alone?
Noise level limit? (Please be kind to neighbors.)
No running?
No splashing?
Ah yes! Have fun!
You are the final authority. It’s your pool!

Happy Swimming!