PROtech

Pool Care

A complete guide to clean, clear, beautiful pool water using PROtech Pool & Spa Chemicals

Introduction

Take care of your pool and it will provide you with enjoyable swimming year after year. If you follow the basics of proper chemical treatment and filtration, pool care will be simple and easy.

This booklet will guide you through the steps you should take from pool start-up, to in-season care, to winter protection. It even covers important tips on safety around your pool and contains a handy trouble-shooting guide.

Take a few moments to complete the following profile for easy reference at a later time.

POOL

Type of finish _____ Shape _____

Piping, Size/Type _____ Capacity in gallons _____

Builder Name _____ Telephone _____

Builder Address _____

Dimensions _____ Date pool completed _____

HEATER

Type _____ Serial Number _____

Make/Model _____ BTU Rating _____

FILTER

Type _____ Backwash Pressure _____

Make/Model _____ Clean Start-up Pressure _____

PUMP

Make/Model _____ Horsepower _____

Make/Time Clock _____ Hours of Operation _____

AUTOMATIC POOL CLEANER

Make/Model _____

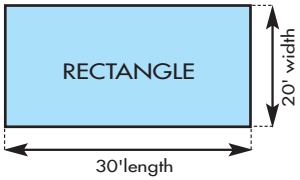
DIVING BOARD

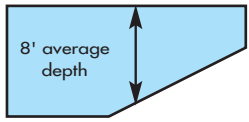
Make/Model _____ Length _____

Sizing Your Pool

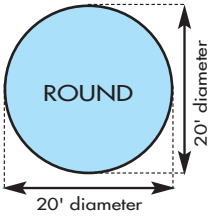
You must know the amount of water that your pool holds in order to know how much chemical to use. Here is a basic chart to calculate your pool volume.

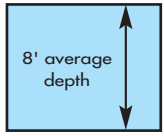
length x width x average depth x 7.5 = pool capacity in gallons



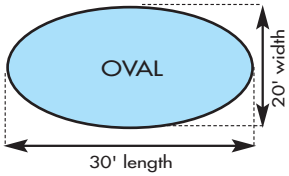


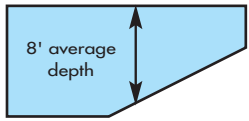
diameter x diameter x average depth x 5.9 = pool capacity in gallons





length x width x average depth x 5.9 = pool capacity in gallons





EXAMPLES

30' length
x 20' width
x 8' average depth
x 7.5
36,000 gallons

20' diameter
x 20' diameter
x 8' average depth
x 5.9
18,880 gallons

30' length
x 20' width
x 8' average depth
x 5.9
28,320 gallons

For all other pools consult your builder, retailer, or serviceman for help.

Filter Systems

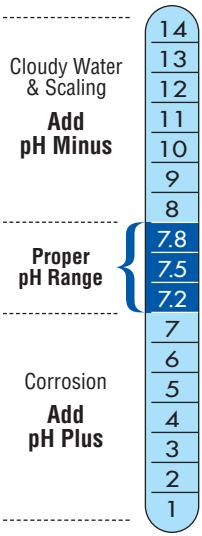
There are three basic filter types: diatomaceous earth (DE), sand, and cartridge. Even though each pool may have its own unique plumbing design, all filter systems will perform the same job. Pool water is drawn through a skimmer or a drain and pumped through a filter which removes dirt, algae and visible contaminants that enter the pool. You must operate the filter system at least eight hours per day in order to remove wastes effectively.

Remember, by filtering properly, you will help avoid contaminant buildup and save on your chemical costs.

You can protect your filter system by adding the correct amount of sand or DE or cleaning your filter cartridge regularly with a filter cleaner to remove oils and other particulates like lint or hair that may lodge in your filter.

Occasionally you may need to apply a **CLARIFIER** such as PROtech Natural Clarifier or PROtech Super Clarifier to help your filter trap minute particles that may be passing through the system.

Water Balance



Your pool is designed to hold the same water for many years. You filter it and chemically treat it over and over again. During this period of time the water can drift out of balance and cause corrosion, scaling or even stains to appear.

You can easily prevent these problems by paying attention to the basics of water balance: pH, Total Alkalinity (to control pH changes), and Total Hardness (calcium). Use your kit often until you become familiar with your pool and supplement your tests by having your professional pool dealer perform detailed tests on occasion to verify your readings and spot trends that could lead to potential problems.

pH measures the acidity or alkalinity of pool water on a scale of "0-14". Extreme acid is "0" and extreme alkali is "14". The proper pH range is 7.2-7.8. pH readings greater than 7.8 will lead to cloudy water and scaling on all pool surfaces, inefficient sanitizing, and swimmer discomfort. pH readings lower than 7.2 can lead to corrosion of pool equipment and surfaces.

You can easily maintain proper pH by using PROtech pH Minus or PROtech pH Plus when needed according to label directions.

TOTAL ALKALINITY measures the level of certain minerals that help control the pH of your pool water. The proper range of Total Alkalinity is between 80-150 ppm (parts per million). Low Total Alkalinity allows pH to fluctuate or "bounce" in either direction and can make it difficult for you to keep the pH stable. For that reason another name for Total Alkalinity is "pH Stabilizer".

NEW! Adjust and maintain both pH and total alkalinity with pHree & Clear™ Balance Tablets. Ask your PROtech dealer for details.

Raise Total Alkalinity by using PROtech Total Alkalinity Increaser according to label directions.

High Total Alkalinity (greater than 150 ppm) locks in the pH, but usually at pH levels above 7.8. This condition needs to be corrected with PROtech pH Minus or muriatic acid. Vinyl, painted and fiberglass pools usually require somewhat higher Total Alkalinity levels than plaster pools and you should consult your professional pool store or serviceman for more details.

HARDNESS measures the level of calcium and magnesium minerals present in your pool water. These minerals exist naturally in all water but the levels vary greatly from one part of the country to another. "Soft" water typically contains 50 ppm Hardness or less while "hard water" may contain 300 ppm Hardness or more. The proper range for plaster pools is 200-250 ppm Hardness and for vinyl, painted or fiberglass pools the proper range is 175-225 ppm Hardness. Pool water low in Hardness causes etching of plaster and corrosion of pool surfaces.

Raise Hardness by adding PROtech Calcium Hardness Increaser according to label directions. Pool water high in Hardness causes cloudiness and scaling to occur.
Control these symptoms by using PROtech Metal Out or PROtech Stain Rust & Scale Control according to label directions or drain a portion of the pool water and refill with water low in Hardness to dilute the mineral level.

MINERAL CONTROL is an important concern for pool owners who use well water or for pools that contain copper plumbing such as heaters. Both conditions can yield trace levels of iron, copper or even manganese that can cause water discoloration and staining. Such discoloration can appear green, blue, brown, or even black in color. This is caused by the reaction between your sanitizer and the particular trace minerals in your pool water.

You can prevent these problems by having your pool water professionally tested for these minerals when your pool is being filled or at any time during the season. If staining minerals are present, apply PROtech Metal Out Plus as soon as possible according to label directions. Use PROtech Stain & Scale Control routinely to prevent future problems. Re-apply the treatment as necessary and consult with your professional pool dealer or serviceman for more information. For existing stains, please refer to the "Trouble Shooting" section of this guide.

STABILIZER refers to "chlorine stabilizers", the final part of pool water balance. This is a chemical that prevents the ultra-violet rays (UV) of sunlight from prematurely breaking down your sanitizer level so that it can do its job sanitizing the pool water.

PROtech Pool Stabilizer will reduce sanitizer consumption by up to 50% and usually needs to be added once a year at the beginning of the pool season. Apply PROtech Pool Stabilizer according to label directions and do not backwash for at least 24 hours.

Sanitizers

Now that your pool water is balanced and stabilized, it's time to sanitize it with chlorine. There are many types of chlorine and your authorized PROtech Dealer or serviceman will explain them all to you. The most economical and convenient choice is "Stabilized" PROtech Chlorinating Tablets or Sticks. This type of chlorine is applied weekly and is not affected by sunlight like hypochlorites (calcium and lithium) or liquid bleach. You can dispense PROtech Chlorinating Tablets or Sticks by placing them in a chlorinator, a floating feeder, or skimmer basket. Again, your PROtech Dealer or serviceman will guide you to the approach that is best for your pool.

The EPA (Environmental Protection Agency) has determined that you must maintain a level of 1- 3 ppm of available chlorine at all times to continuously kill bacteria, algae and other micro-organisms.

By using slow dissolving PROtech Chlorinating Tablets or Sticks you will be able to give your pool 24 hour protection. During pool start-up, you may need extra doses of chlorine in order to satisfy the initial chlorine demand of your pool water. This demand could include contaminants such as organics and debris that built up before you started using chlorine. Use your test kit often to check your chlorine level and adjust your chlorinator or floater as needed to increase or decrease the flow.

A few important factors affect the amount of PROtech Chlorinating Tablets or Sticks your pool will consume. They are: temperature, bathing load, rainfall, and pH. The warmer the pool water, the greater the use of PROtech Chlorinating Tablets or Sticks. The greater the bathing load, the greater the requirement of PROtech Chlorinating Tablets or Sticks. Heavily used pools increase the load of contaminants such as perspiration, mucous and tanning lotions – all of which consume chlorine. The greater the rainfall, the greater the requirement of PROtech Chlorinating Tablets or Sticks. Rain washes airborne contaminants such as pollen and algae spores into the pool and tends to lower the pH of the water by contributing "acid rain", a chemical reaction between rain and air pollution. Finally, low pH causes chlorine to be "overactive" and dissipate too quickly. Proper control of Total Alkalinity will prevent low pH and save on chemical costs.

If you prefer to sanitize your pool by hand, "Stabilized" PROtech Dy-Chlor II is the proper choice. These granules are completely soluble in all common swimming pool water temperatures and provide the same 24 hour protection that you get from PROtech Chlorinating Tablets or Sticks.

Shock Treatments

Various contaminants such as swimmer waste, lotions, and oils can resist normal chlorination and start to build up in the pool water. This buildup usually occurs during hot weather and periods of heavy bathing when your filter is already working overtime. A weekly **SHOCK** treatment when applied according to label directions will oxidize or burn-up these contaminants for a period of 12-24 hours.

It is best to apply **SHOCK** in the early evening so that it can work overnight and allow the chlorine levels to return to normal by the next day. Be sure to continue to run your filter during this period of time.

TIP! During the hot summer months, a regular shock program using one of PROtech's shock products – PROSHOCK, PRO 35, or PROtech SUPER PROSHOCK – will help reduce the overall operating costs of your pool. Remember to allow the chlorine level to drop to 3 ppm or less before re-entering the pool. If you are in a hurry and want to swim soon after shocking your pool, use PROtech NO CHLOR, a non-chlorine, oxygen based shock/oxidizer product.

Algaecides

Algaecides are excellent treatments to prevent or kill algae growth when used with chlorine. As a preventative, algaecides act as an insurance policy in your pool killing algae spores as they enter the water. Algae spores are constantly entering your pool from rain, wind, water and dust storms and they multiply rapidly in sunlight and warm water. Routine chlorination cannot always cope with the rapid growth of an algae "bloom", the visible outburst of algae. These algae can appear green, brown, mustard or even pink in color.

By the time algae has bloomed there are millions of algae cells in every gallon of water!

Your Authorized PROtech Dealer or service-man has a variety of algaecides for all kinds of algae and will recommend the best choice for either prevention or killing needs.

Troubleshooting

Sometimes even the most experienced pool owners run into pool problems. Here are a number of the most common problems and recommended actions.

CLOUDY WATER

Make sure the filter is operating properly and the correct amount of filter media has been used. Adjust the pH, if necessary, to 7.2 - 7.8 and SHOCK treat the water. If the condition does not improve, try adding PROtech Super Clarifier or PROtech Natural Clarifier. Continue filtering and maintain the required level of chlorine. If your pool water is "OLD" and has a high level of dissolved solids (calcium), stabilizer, chlorides and other salts, you may need to drain a portion of the water and refill with fresh water. Your Authorized PROtech Dealer or serviceman can test this for you and advise the correct action.

ALGAE

There are many types that can infect pool water. The most common types, the floating or clinging green algae, respond quickly to a shock treatment and dose of maximum strength algaecides such as PROtech Algaecide 60 Plus or PROtech Maintenance Algaecide. Be sure to adjust the pH, if necessary, to 7.2 - 7.8 before shocking and brush all pool surfaces to expose algae hiding in cracks or wrinkles. Apply the algaecide the next day. Pink algae and mustard algae require extra care because they both tend to reinfect pool water very easily. Treat pink algae in the same manner as outlined above but, in addition, sanitize all pool parts that come into contact with the water, such as the vacuum hose and head, by immersing them in the pool during the shock treatment. Treat mustard algae with a special algaecide designed to combat this strain. Clinging black algae that tends to appear as dots or nodules can be treated by applying a slow dissolving granular algaecide (for use only on plaster or concrete surfaces), such as PROtech Black Out Granular 90. Apply directly to the algae and brush the algae vigorously to expose its roots. In all cases, apply PROtech Algaecide 60 or PROtech Maintenance Algaecide directly into the pool as close to the algae as possible.

COLORED WATER

Reddish or brownish colored water is usually caused by metals such as iron and manganese. Treat the pool water with PROtech Metal Out Plus to tie up the metals and prevent the discoloration process.

GREEN OR BLUE COLORED WATER

Usually caused by high levels of copper in the water. Treat the condition as above and consult with your Authorized PROtech Dealer or serviceman for more details. Be sure not to confuse green, slimy water that indicates an algae infection with the greenish cast associated with copper.

STAINS AND SCALE

Stains can develop when colored water is left unattended or when metals such as coins are accidentally left in the pool. Scale is a crusty buildup on pool floors and walls caused by excessive calcium levels and high pH. Usually, both conditions must occur for scale to form. Both stains and scale can be controlled by lowering pH, if necessary, and by using a stain and scale remover such as PROtech Metal Out Plus according to label directions. Severe conditions, especially in plastered pools, may require treatment using PROtech Super Metal Eliminator. Extreme conditions may require an "acid wash" - a draining and cleaning procedure - performed by your Authorized PROtech Dealer or serviceman.

NEW! It may be possible to avoid an "acid wash" procedure by using PROtech A+ Stain Remover available from an authorized PROtech Dealer.

EXCESSIVE OR INADEQUATE CHLORINE LEVELS

Inability to hold a chlorine reading usually indicates lack of STABILIZER in the water. Have your water tested for STABILIZER and add if necessary. Also be sure to check your floater or chlorinator to insure a supply of chlorine. Low readings could signal an excessive chlorine demand that is not being met. In this case, a SHOCK treatment would be appropriate. Finally, your testing chemicals (reagents) may be old and need to be replenished. Check with your Authorized PROtech Dealer or serviceman for accurate water testing.

A high chlorine reading that won't dissipate gradually may indicate too much chlorine is being added to the water. Check your floater or chlorinator and make the necessary adjustment. You may need to use PROtech Chlorine Neutralizer to reduce excessively high levels of chlorine.

On occasion, CHLORAMINES (chlorine reacted with swimmer waste) can develop and cause the chlorine reading to remain high depending on the type of test kit used. In this case, a SHOCK treatment corrects the condition by breaking up the chloramines.

Glossary of Terms

ACID
A chemical substance containing hydrogen with the ability to dissolve metals, neutralize alkaline materials and combine with bases to form salts. Acid is used to lower (decrease) pH and total alkalinity of swimming pool and spa water. Examples are muriatic acid (hydrochloric) and dry acid (sodium bisulfate).

ACID DEMAND
The amount of acid required to bring high pH and total alkalinity down to their proper levels. Determined by an acid demand test.

ALGAE
Microscopic aquatic plant life that contain chlorophyll. Algae are nourished by carbon dioxide (CO2) and use sunlight to carry out photosynthesis. It is introduced by rain or wind and grows in colonies producing nuisance masses. Algae are not disease-causing, but can harbor bacteria, create a high chlorine demand, and it is slippery. There are 21,000 known species of algae. The most common pool types are black, blue-green, green and mustard (yellow or brown). Pink or red-colored algae-like organisms exist but are bacteria and not algae. Maintaining proper sanitizer levels, brushing and superchlorination will help prevent its occurrence.

ALGAECIDE
Also called algicide. A natural or synthetic chemical designed to kill, destroy or control algae.

ALKALINITY
Also called total alkalinity.A measure of the pH-buffering capacity of water or water's resistance to change in pH. Composed of the hydroxides, carbonates and bicarbonates in the water. One of the basic water tests necessary to determine water balance.

AMMONIA
Introduced into the water by swimmers as waste (perspiration or urine) or by other means. Quickly forms foul-smelling, body-irritating chloramines - an undesirable, less effective form of chlorine. See chloramines or combined chlorine.

AVAILABLE CHLORINE
The amount of chlorine in the pool water that is available to sanitize or disinfect the water. Sometimes called residual chlorine.

BALANCED WATER
The correct ratio of mineral content and pH level that prevents the water from being corrosive or scale forming.

BROMAMINES
By-products formed when bromine reacts with swimmer waste (perspiration or urine), nitrogen or fertilizer. Bromamines are active disinfectants and do not smell.

BROMINATOR
A mechanical or electrical device for dispensing bromine at a controlled rate. Most often a tank, canister or floater filled with tablets of bromine.

BROMINE
A halogen element in the same group as chlorine and flourine. Also a common name for several chemical compounds containing bromine that are used as disinfectants to destroy bacteria and algae in swimming pools and spas. Most commonly available as organic bromine in a tablet or granular, or as sodium bromide, a granular salt.

BUFFER
A substance or compound that stabilizes the pH value of a solution. It is also the water's resistance to change in pH.

CALCIUM HARDNESS
The calcium content of the water. Calcium hardness is sometimes confused with the terms water hardness and total hardness. Too little calcium hardness and the water is corrosive. Too much calcium hardness and the water is scale forming. One of the basic water tests necessary to determine water balance. Minimum level is 150 ppm. Ideal range is 200 to 400 ppm.

CHELATED COPPER
Copper algaecides that contain a special ingre-dient to prevent the copper from staining the pool walls and bottom or producing colored water.

CHLORAMINES
Undesirable, foul-smelling, body-irritating compounds formed when insufficient levels of free available chlorine react with ammonia and other nitrogen containing compounds (swimmer and bather waste, fertilizer, perspiration, urine, etc.). Chloramines are still disinfectants, but they are a much weaker, ineffective form of chlorine. Chloramines are removed by superchlorination or shock treating.

CHLORINE
A term used to describe any type of chlorine compound used as a disinfectant in swimming pool and spa water or to kill, destroy or control bacteria and algae. In addition, chlorine oxidizes ammonia and nitrogen compounds (swimmer and bather waste).

CHLORINE DEMAND
The amount of chlorine necessary to oxidize all organic matter (bacteria, algae, chloramines, ammonia and nitrogen compounds) in the pool or spa water.

CHLORINE RESIDUAL
The amount of chlorine left in the pool or spa water after the chlorine demand has been satisfied.

CLARIFIER
Also called coagulant or flocculant. A chemical compound used to gather (coagulate or agglomerate), or to precipitate suspended particles so they may be removed by vacuuming or filtration. The are two types; inorganic salts of aluminum (alum) or water-soluble organic polyelectrolytes.

COAGULANT
An organic polyelectrolyte used to gather (coagulate) suspended particles in the water.

COMBINED CHLORINE
Undesirable, foul-smelling, body-irritating compounds formed when insufficient levels of free available chlorine react with ammonia and other nitrogen-containing compounds (swimmer and bather waste, fertilizer, perspiration, urine, etc.). Combined chlorine is still a disinfectant, but it is a much weaker, ineffective form of chlorine.

CONDITIONER
In this guide, conditioner is a chemical called cyanuric acid. It slows down the degradation of chlorine in the water by sunlight. The minimum effective level is 30 ppm as measured by a test kit. Very high levels of Cyanuric acid (above 300 ppm) can slow down chlorine activity or effectiveness. Conditioner does not protect bromine from sunlight.

COPPER ALGAECIDE
A chemical compound that contains the element copper. Copper sulfate was one of the original copper algaecides. Too much copper in the water can cause green-colored stains. Newer copper algaecides contain an ingredient that prevents the copper from staining but does not affect copper's ability to kill algae. These special copper algaecides are called chelated copper algaecides.

CYANURIC ACID
Also called conditioner or stabilizer, this chemical compound protects chlorine in the water from being destroyed by sunlight. The minimum level is 20 ppm. Very high levels of Cyanuric acid (above 300 ppm) can slow down chlorine activity or effectiveness. Cyanuric acid does not protect bromine from sunlight.

D. E. FILTER
Diatomaceous Earth Filter. A filter designed to use diatomaceous earth (D.E.) as the filter medium. The D.E. is added through the skimmer with the pump on, which takes the D.E. and deposits it on a grid. The D.E. then becomes the filter medium.

DIATOMACEOUS EARTH
Also called D.E. A white powder composed of fossilized skeletons of one-celled organisms called diatoms. The skeletons are porous and have microscopic spaces. The powder is added through the skimmer with the pump on and deposits itself on a grid. The powder then becomes the filter medium.

DICHLORO
The common name for sodium dichlorisocyanurate. A fast-dissolving chlorine compound containing chlorine and cyanuric acid (stabilizer or conditioner). It has a neutral pH and is quick-dissolving, so it can be used for regular chlorination or superchlorination.

DRY ACID
Chemically, sodium bisulfate. A dry white crystal that produces acid when added to water. It is used for lowering pH and total alkalinity. Safer to handle than muriatic acid.

EFFLUENT
The water that flows out of a pump, filter or heater, usually on its way back to the pool or spa.

FILTER AID
A chemical compound added to the water or to the filter that allows the existing filter to become more efficient. Examples are alum, water clarifiers and D.E. (diatomaceous earth).

FLOC
The clump or aggregate formed when suspended particles combine with a flocculating agent. See flocculation.

FLOCULATION
The combination, agglomeration, aggregation or coagulation of suspended particles in such a way that they form small clumps (called a floc).

FREE AVAILABLE CHLORINE
The amount of active chlorine in the pool or spa water that is available to sanitize or disinfect the water. Sometimes called residual or available chlorine.

HARDNESS
The amount of calcium and magnesium dissolved in the water. “Water” or “total” hardness refers to the total magnesium and calcium dissolved in the water. Calcium hardness refers to just the calcium. Measured by a test kit and expressed as ppm. The proper range is 200 to 400 ppm.

HYPOCHLORITE
The name given to a family of chlorine containing compounds, including calcium hypochlorite, sodium hypochlorite and lithium hypochlorite, that are used as disinfectants and sanitizers in pool and spa water.

LITHIUM HYPOCHLORITE
A dry, granular chlorinating compound with an available chlorine content of 35%. It is rapid-dissolving and can be used to superchlorinate vinyl-liner pools, painted pools or fiberglass pools as well as spas and hot tubs.

MINERAL
A substance that is neither animal nor plant. It is a chemical compound, usually inorganic in nature (no carbon atoms), which occurs naturally. Examples are quartz, feldspar or compounds of crystalline stucture. It sometimes includes soluble “rocks” such as limestone. Ground water can dissolve all or a portion of these rocks and the minerals contained in these rocks, thus causing these minerals to be present in tap water. Certain geographic locations contain a high level of minerals which can cause staining and scale problems in pool and spa water.

NON-CHLORINE SHOCK
A term given to a class of chemical compounds that are used to oxidize or shock the water (destroy ammonia, nitrogen and swimmer waste). They contain no chlorine or bromine and do not kill living organisms. Swimmers may re-enter the water in only 15 minutes after adding a non-chlorine shock.

ORGANIC
Refers to volatile, biodegradable and sometimes combustible chemical compounds containing carbon atoms bonded together with other elements. The principal groups of organic substances found in water are proteins, carbohydrates, fats and oils. See organic waste.

ORGANIC WASTE
Also called swimmer or bather waste. All of the soap, deodorant, suntan lotion, lipstick, makeup, cologne, body oils, sweat, spit, urine, etc., brought into the water. They also form chloramines, which are foul-smelling and body irritants. Requires large amounts of chlorine or non-chlorine shock to destroy.

OXIDATION
To rid the water of ammonia, nitrogen compounds and swimmer waste (organic compounds). These organic compounds disable chlorine, are body irritants and have a foul smell. Removal is accomplished by superchlorination or by shock treating with a non-chlorine oxidizer.

OXIDIZER
A shocking or sanitizing compound that removes or destroys built-up contaminants and chloramines in pool water. Most chlorinating, brominating, and oxygenating compounds are considered oxidizers. Usually the fast dissolving oxidizers which contain chlorine, such as the hypochlorites, are typically used to “superchlorinate” the water.

RESIDUAL BROMINE
The amount of measurable bromine remaining after treating the water with bromine. The amount of bromine left in the pool or spa water after the bromine demand has been satisfied.

RESIDUAL CHLORINE
The amount of measurable chlorine remaining after treating the water with chlorine. The amount of chlorine left in the pool or spa water after the chlorine demand has been satisfied.

SCALE
The precipitate that forms on surfaces in contact with water when the calcium hardness, pH or total alkalinity levels are too high. Results from chemically unbalanced pool and spa water. Scale may appear as gray, white or dark streaks on the plaster, fiberglass or vinyl. It may also appear as a hard crust around the tile.

SHOCK TREAT
The practice of adding significant amounts of fast-desolving oxidizing chemical - (usually the hypochlorites) - to the water to destroy ammonia and nitrogen compounds or swimmer waste.

STABILIZED CHLORINE
A family of chlorine pool sanitizers that contain conditioner (cyanuric acid or isocyanuric acid) to protect the chlorine from the degrading UV rays in sunlight. Most common types are sodium dichlor and trichlor. The granular form is dichlor, which is fast-dissolving and can be used for regular chlorination or superchlorination by broad-casting into the pool or spa. Tablet or stick form is trichlor (which is usually used in a chlorine feeder - either the floating type or in-line erosion type) used for regular chlorination only.

STAIN
A discoloration or a colored deposit on the walls or bottom of a swimming pool or spa. Most often, stains are metals such as iron, copper or manganese. They may appear as green, gray, brown or black. They may even discolor the water. Sometimes a sequestering agent or chelating agent will remove them. If not, usually an acid wash is necessary to remove them from the walls and bottom. The metals get in the water because the pH was too low or someone has added a low pH chemical directly into the circulation system. The low pH chemical dissolves a small amount of metal from the equipment. The metals come out of solution and deposit or stain the surfaces of the walls and bottom of the pool. Stains are sometimes confused with scale.

SUPERCHLORINATION
The practice of adding an extra large dose (5 to 10 ppm) of chlorine to the water to destroy ammonia, nitrogen and swimmer waste, which can build up in the water. This level of chlorine is required to destroy all of the combined chlorine in the water which is called breakpoint chlorination.

TOTAL ALKALINITY
The total amount of alkaline materials present in the water. Also called the buffering capacity of the water. It is the water's resistance to change in pH. Low total alkalinity causes metal corrosion, plaster etching and eye irritation. High total alkalinity causes scale formation, poor chlorine efficiency and eye irritation.

TOTAL CHLORINE
The total amount of chlorine in the water. It includes both free available and combined chlorine.

TDS
Total Dissolved Solids is a measure of the total amount of dissolved material in the water. It is comprised of the spent or carrier chemicals in the water every time chemicals are added, as well as the hardness, alkalinity, chlorides, sodium, magnesium, calcium, etc. The maximum amount in pools is 2500 ppm. Maximum in spas is 1500 over starting TDS. The only way to effectively lower TDS is to drain part or all of the water and replace it with low TDS water.

TRICHLOR
A slow-dissolving tablet or granular, stabilized organic chlorine compound providing 90% available chlorine. Used for regular chlorination but must be dispensed using a floating feeder or an in-line feeder (chlorinator). Trichlor contains an ingredient (cyanuric acid or stabilizer) that prevents the chlorine from being destroyed by the ultraviolet (UV) rays of the sun. Trichlor has a pH of 2.8, and regular trichlor tabs should not be placed in the skimmer as the low pH will corrode the metal components in the equipment.

TURBIDITY
The cloudy condition of the water due to the presence of extremely fine particles in suspension that cannot be trapped by the filter because they are too small. Adding a clarifier will coagulate the particles and make the filter more efficient.

WATER CLARIFIER
Also called coagulant or flocculant. A chemical compound used to gather (coagulate or agglomerate) or to precipitate suspended particles so they may be removed by vacuuming or filtration. There are two types; inorganic salts of aluminum (alum) and other metals or water-soluble organic polyelectrolytes.

pH
A term used to indicate the level of acidity or alkalinity of pool water. Too low a pH causes etched plaster, metal corrosion and eye irritation. Too high a pH causes scale formation, poor chlorine efficiency and eye irritation. The ideal range for pH in swimming pools is 7.4 to 7.6.

ppm
An abbreviation for parts per million. It is a weight-to-weight expression. It means 1 part in 1 million parts, such as 1 lb. of chlorine in 1 million lbs. of water. Many of the common pool water tests, as well as acceptable ranges, are stated as ppm. For example, free available chlorine should be kept between 1.0 and 3.0 ppm; total alkalinity should be between 80 and 120 ppm; and water hardness should be between 200 and 400 ppm.

Pool Opening Tips

CALCULATE POOL CAPACITY:

SHAPE OF POOL	**GAL. OF WATER** (Dimensions in ft.)
Rectangular	Avg. depth x avg. length x avg. width x 7.5
Circular	Diameter x diameter x avg. depth x 5.9
Oval with straight sides	Full width x full length x avg. depth x 5.9
Irregular	Consult pool builder

CHECK EQUIPMENT:
Ensure all drains, filters and skimmers are clear of any debris.

BALANCE POOL WATER:
The following parameters should be checked on a regular basis.
Consult your PROtech Dealer for proper levels in your area.

- Chlorine/Bromine
- pH
- Total Alkalinity
- Stabilizer/Conditioner
- Calcium Hardness

Chemical Safety Tips

KEEP ALL CHEMICALS OUT OF THE REACH OF CHILDREN!
READ AND FOLLOW LABEL DIRECTIONS!

STORAGE
Always store chemicals in a clean, cool, dry and well-ventilated area.
Keep containers tightly closed when not in use.
Keep liquid and dry chemicals separate.

DISPOSAL
Do not reuse empty chemical containers.
Follow container and product disposal directions on product labels.

USE
Read carefully and follow directions for use on all labels before using.
Do not prepare chemicals in closed area.
Do not smoke while handling chemicals.
Do not use quantities in excess of label instructions.
Wear protective gloves and safety goggles when handling chemicals.
Wash hands and exposed skin after handling any chemicals.
Use a clean, dry utensil for granular chemicals.
Never mix different types of chlorine.
Never mix chemicals, always add chemicals to the pool separately.

NEVER ADD WATER TO CHEMICALS!
ALWAYS ADD CHEMICALS TO LARGE QUANTITIES OF WATER!

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