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## RECOMMENDED RANGES FOR DESIRED WATER BALANCE

CHLORINE	1.0 – 4.0 PPM
P.H.	7.4 – 7.6 PPM
TOTAL ALKALINITY	125 – 150 PPM
CALCIUM HARDNESS	175 – 225 PPM
STABILIZER CYANURIC (conditioner)	30 – 200 PPM

## CARE AND MAINTENANCE

Your swimming pool is a source of pleasure and relaxation for the entire family. It provides health-building recreation for everyone in your family, regardless of age or inclination.

One the “getting acquainted” period is over, you will find that keeping your pool in proper condition is just as easy and pleasant as swimming in it. There are certain simple, basic facts of which you must be aware to assure the utmost please and services from your pool.

This guide, along with information received from **WaterWorks Pools and Spas** will instruct you in the care and use of your pool.

You now have a pleasant spot for healthful relaxation and family fun, an ideal center for outdoor social gatherings, a natural “spa” for mental and physical therapy, a muscle toning and body building area, an architectural feature that enhances the attractiveness and value of your property.

As with a new baby, you may tend to over-care for your pool when it’s new. Our recommendations for maintenance are designed to allow you more time for enjoyment while maintaining crystal clear, blue, sparkling water.

You pool was built for pleasure, and you will enjoy swimming much more in pure, clear sparkling water – water that has been treated to assure comfort and safety to you, your family and your guests.

There are two primary systems involved in maintaining water purity, the water chemistry system and the filtration system. Both systems must perform properly; you cannot be substituted for the other. When you fill your pool for the first time,

the water may appear cloudy or turbid. Don't be alarmed. Since your pool is filled with drinking water, the same water you use in your home, you can assume it is sparkling clear. Appearances can be deceiving. In small amounts, such as a glassful, most tap water will indeed appear clear. In much larger amounts, such as a poolful, that clarity often disappears.

Water, which is perfectly acceptable for the household, may be totally unacceptable for your pool. This is the reason your pool water must be professionally tested and balanced every four to six weeks.

You can trust **WaterWorks Pools and Spas** to test your water and supply you with the proper chemicals and instructions to maintain crystal clear, blue, sparkling water.

## **FIVE BASIC STEPS OF WATER CHEMISTRY**

**These steps are performed poolside**

### **STEP 1: PH CONTROL**

Your test kit determines pH, which is the measure of acidity or alkalinity of the water. Proper pH maintenance is extremely important, as it is responsible for the correct bacterial action of the chlorine, swimmer comfort and prevents deterioration of the equipment and the pool itself. A proper pH reading is 7.2 – 7.6. Ideally, your pool should be maintained at the lower level or 7.2.

After testing the water, if the pH is too high (above 7.6), chlorine efficiency is reduced, scaling of surfaces and equipment may occur, water may become cloudy and shorter filter runs may occur. To correct this condition, a pH decreaser is added directly to the water. There are two forms of pH decreaseers: 1) liquid **Muriatic Acid** and 2) granular sodium bisulfate.

If the pH is too low (below 7.2), chlorine dissipates more rapidly, water may be irritating to the swimmers and corrosion of equipment and pool surface may occur. To correct this situation, a pH increaser is added directly to the water. PH increaser is commonly called **Soda Ash**

## **STEP 2: CONTINUOUS DISINFECTION**

Chlorine treatment is to maintain water purity. Chlorine residual should be between 1.0 – 4.0 PPM. The use of tri-chlor-s-triazine-trione (in tablet or stick form), insures even levels or continuous chlorination. Usage rate will be approximately one half to one pound of chlorine per 10,000 gallons of pool water per week. As with any pool chemical, follow the directions of the container.

## **STEP 3: SUPER CHLORINATION**

Super chlorinating or shock treatment is a chemical treatment to eliminate non-filterable wastes from the pool water. A granular chlorine product such as calcium hypochlorite or sodium-diclor-s-triazine-trione-dihydrate is used to obtain a chlorine reading of 8.0 – 10.0 PPM.

Also available and highly recommended is a non-chlorine shock treatment such as Potassium Peroxymonosulfate. Non-chlorine shock treatment is an effective oxidizer for restoring water sparkle without chlorine. By shocking with a non-chlorine shock treatment, you can avoid extremely high chlorine readings or raising an already high chlorine reading.

## **STEP 4: PREVENTION OF ALGAE**

Contaminants in the rain and wind can quickly deplete the chlorine supplies in the pool. A high-quality algaecide acts as a chemical back up system in the event the chlorine becomes exhausted from the pool.

Following a one-time initial treatment, add a maintenance directly to the pool every week or every other week.

## **GENERAL CHEMICAL INFORMATION**

From the very first day you fill your pool, its purity must be guarded and maintained by chemical disinfectant. Enough of it must “reside” there to kill disease carrying bacteria and algae brought into the water by bathers, wind, rain, etc.

The amount of chemical “residual” which must be present in pool water is expressed as so many parts of disinfectant per million parts of water, abbreviated as “PPM”.

The same quantitative measure is used to express the amount of any other chemical added or present in the water.

Chlorine is the most widely used and accepted disinfectant for swimming pools. When chlorine is used as a disinfectant, at least 1.0 PPM of “free residual chlorine” **MUST** always be present in pool water to kill bacteria and algae and maintain the water’s purity. Critical though this “residual” is for pool purity, it is a very small amount of chemical. Less than one drop of chlorine in every 1,000,000 drops of pool water is enough to disinfect the pool, providing the chemical is 100% active.

Here is a list of the common factors affecting the in-pool longevity of chlorine:

1. **BATHING LOAD** – the number of swimmers who use the pool. The greater the number of swimmers, the more disinfectant is used up.
2. **SUNLIGHT** – the greater the sun’s intensity, the faster the dissipation “residual” unless the pool is stabilized.
3. **WATER TEMPERATURE** – the warmer the pool’s water, the shorter the life of chlorine. This process is greatly accelerated when the water temperature exceeds 85 degrees.
4. **WINDS AND RAIN** – the carrying of dust, bacteria, algae spores and other debris into the pool, overworking the chemical disinfectants and reducing their ability to sanitize.
5. **PH BALANCE** – as the pH of the pool water rises, disinfectant action slows down. More disinfectant must be added to maintain the proper “residual”.

To maintain your pools’ bacteria killing residual, disinfectant chemicals may be added by hand or by chemical feeder. Feeders may be adjusted to increase or decrease the feed rates of disinfectants depending upon the chemical demand of your pool.

Granular disinfectants are simply sprinkled into the pool water. Begin at the deep end; move completely around the pool distributing evenly throughout the pool.

## **PH**

The ideal level for pool water pH is 7.2 – 7.6. Water that is neutral, that is neither basic nor acidic, has a pH value of 7.0. This is mid-point on the 0-14 pH scale.

Above 7.0 pH, the water is acidic. The higher up on the pH scale the pool water tests, the more alkaline it is.

Below 7.0 pH, the water is acidic. The lower down the pH scale the pool water tests, the more acidic it is.

Maintaining your pool slightly on the alkaline side (Note: that the recommended 7.2 – 7.6 pH level is above the neutral point, thus alkaline), is important for several reasons.

When pool water is too alkaline, above 7.6, disinfecting chemicals work more slowly. They may not do their proper killing job, even though tests of the water indicate a proper residual. Also, scale may form on or in the pool equipment and piping and especially in pool heater coils.

On the other hand, if the pool water becomes acidic, it irritates the eyes, corrodes the equipment and piping, and can result in pool interior surface stains.

To test the pH of the pool water, follow the instructions provided in your test kit. Do not add any test chemicals directly into the pool and do not put the pool water back into the pool after testing. High chlorine residual in your pool can affect the water's pH reading. Take the pH reading before adding chlorine to the pool. Do not hold your finger over the top of the test tube while mixing; your body acids can cause a false test reading.

## **TOTAL ALKALINITY**

Occasionally, the pool water should be tested for “total alkalinity”. Total alkalinity is a measurement of the total amount of alkaline chemicals in the water. It refers to the degree of resistance to pH change of pool water or its “buffering capacity”. The proper alkalinity is between 80 – 125 PPM.

Low alkalinity waters make pH control difficult because of the lack of buffering capacity, or pool resistance to the pH change. Alkalinity must be increased in these waters to offset the possibility of the pool water reverting to acid.

Many waters are high total alkalinity and high pH. To get these waters into the swimming pool “comfort zone”, it is necessary to destroy a portion of the alkalinity so the pH can be lowered. This can be accomplished by the addition of Muriatic Acid.

## **CALCIUM HARDNESS**

The hardness of your pool water, which refers to the quantity of calcium and magnesium in the water. When evaporation takes place in your pool, calcium is left behind and increases the hardness of the water. High levels may cause cloudy water, scaling of pool surfaces, piping and equipment in the re-circulation system. Low levels may lead to equipment corrosion and pool surface damage. The desired range of calcium hardness is 200 – 275 PPM. Hardness increaser can help you reach the right amount of hardness in you pool water.

Other factors of vital importance are metal contents, Cyanuric acid and total dissolved solids. **WaterWorks Pools and Spas** recommends that you bring a water in at least every four to six weeks to be tested to ensure they are within proper range.

## **HANDLING AND STORING POOL CHEMICALS**

1. Keep ALL chemicals out of the reach of children and pets.
2. READ all labels and follow instructions BEFORE opening pool chemicals. Some vapors are toxic.
3. Date all chemicals on the container. Most pool chemicals are stable, retaining their effectiveness and strength for a considerable amount of time when stored properly.
4. Keep the original lid on all chemical containers and make sure all lids are tightly sealed. Store chemicals in a cool, dry place.
5. Chlorine chemicals are concentrated chemicals, which can be dangerous if not handled properly. DO NOT MIX THEM WITH ANYTHING EXCEPT WATER.
6. Use plastic, glass, china or enamel ware scoops, measures, and spoons... and be sure they are clean and dry.
7. Measure and add pool chemicals separately, according to the directions. Do not mis one with another before adding them to the pool.

8. Most pool chemicals are harmful to shrubs, grass, and foliage in concentrated form. Keep pool chemicals away from plant life near the pool.
9. Your hands should be clean and dry when dispensing pool chemicals. Wash your hands thoroughly after treating pool.
10. Run your pool filter after adding chemicals to evenly disperse them throughout the pool water, unless the directions state otherwise.

## **TESTING POOL WATER**

Proper testing procedures ensure accurate chemical readings.

1. Read and carefully follow testing instructions enclosed with your test kit.
2. Rinse test tubes with pool water before filling the tubes for testing.
3. Take water sample for testing 12 to 13 inches deep in pool. DO NOT take a sample from the surface water in the pool; this will affect the accuracy of the test.
4. Always read the test results against a white background.
5. Always test chlorine first, then the pH.
6. Keep your test kit in a COOL, dry place.
7. Replace test reagents every year. The reagents lose their accuracy due to exposure to heat and light.

## **WHEN TO TEST**

1. CHLORINE RESIDUAL – Every day, if no marked change, every other day or twice a week.
2. pH LEVEL – Every day, if no marked change, every other day or twice per week.
3. TOTAL ALKALINITY – Every 4 to 6 weeks.
4. CALCIUM HARDNESS – Every 2 to 3 months.
5. METAL CONTENT – Every 2 to 3 months.
6. CYANURIC ACID, TOTAL DISSOLVED SOLIDS – Every 2 months

The pool water should be tested for chlorine residual, pH level, total alkalinity, calcium hardness, copper and iron after each rain of consequence or upon addition or more than eight inches of fresh water.

## **MAINTAINING WATER LEVEL IN YOUR POOL**

For best operation, keep the water level in your pool near the center of the skimmer. A lower level can cause damage to the pump and filter by allowing air into the system. A higher level reduces the efficiency of the skimmer.

### **ABOVE THE WATER LINE**

The “bathtub” ring, caused by body oils, suntan lotions and contaminations from the air, is easily removed with warm water and an approved swimming pool surface cleaner for fiberglass, vinyl liner or painted pools. **DO NOT** use abrasive cleaners, steel wool, metal scrapers, wire brushes or metal tools.

### **BELOW THE WATER LINE**

More brushing than vacuuming is our recommendation. A large percentage of the dirt, dust, soil, etc. that sinks to the bottom can be brushed down and through the main drain and will be caught in the filter. Heavy excesses after a storm, heavy rain, etc. should be vacuumed out (see below). Use your pool’s leaf rake to remove leaves.

## **VACUUMING THE POOL**

Vacuuming your pool removes all debris from the pool. The following steps are the recommended method of vacuuming. If you have any questions regarding this, contact **WaterWorks Pools and Spas**.

1. Remove skimmer lid from skimmer.
2. Attach vacuum hose to vacuum head on the pole. Sink vacuum head and pole into pool.
3. Fill vacuum hose with water by holding hose in front of return inlet until bubbles stop coming out of the vacuum head under the water.
4. Vacuum hose **MUST** be full of water before plugging it into the skimmer.
5. Insert vacuum hose into the suction outlet of the skimmer or into the vacuum plate.
6. Vacuum pool. Do not remove head from water until you are finished vacuuming the pool. Vacuum from the deep end to the shallow end. Do not vacuum metal caps or large leaves as they may clog the plumbing lines.

7. After vacuuming is complete, disconnect the hose from the skimmer. Remove the vacuum head and pole from the pool, rinse with fresh water (not from the pool). Do not store vacuum hose in sunlight, as this will shorten the life of the hose by about 50%. Coil the vacuum hose and store it in the garage or storage room. A large garbage can makes an ideal outdoor storage container for the vacuum hose and vacuum head.
8. Empty skimmer basket and replace the lid on top of the skimmer.

### **CARING FOR YOUR SWIMMING POOL EQUIPMENT**

1. Do not run your pump dry. **The warranty on your pump and motor is null and void if the pump has run dry.** If the strainer cavity is drained of water during the cleaning of the strainer basket, it must be “primed” prior to starting the system again. Filling the pump pot with water and then quickly sealing the lid accomplishes this. If your pump does not maintain its prime, contact **WaterWorks Pools and Spas**.
2. Save all instruction tags and warranties on your pump and motor. It is a good idea to copy all information from the motor in the event a replacement motor or parts are needed.
3. Prevent the motor from getting wet. When hosing down your deck, keep water away from the motor. Rain and/or water off the eaves of the house can also damage the motor. A cover over the motor will ensure longer life of the motor. This cover should allow adequate ventilation, so the motor does not run hot.

Your circulation system should run a minimum of 12 hours per day during the summer months. **WaterWorks Pools and Spas** recommends running the pump during the hottest parts of the day, from 7 a.m. to 7 p.m. or 8 a.m. to 8 p.m. During the winter months, it is advisable to run your circulation system at night to prevent the equipment from freezing during severe weather.

### **PUMP BASKET**

The pump basket collects lint, hair, etc. and prevents it from entering the pump and filter. Clean as required, typically once per week. Before removing lid to pump housing, be sure to turn off the motor. After cleaning and re-securing the pump housing lid, prime the pump and turn the motor back on. Open the air relief

valve on top of the filter to remove air, which may be trapped in the filter. Silicone based grease on the O-ring in the lid will assure you of a better seal. Sandy dirt collected in the bottom of the strainer housing can be washed out by removing the plug at the bottom of the strainer housing and flushing with a water hose.

## **FILTERS**

Consult your manufacturer's instructions on operation, maintenance and warranty on your filter. The following suggestions are for the operations of the different types of filters.

### **SAND FILTERS**

Sand filters are cleaned by a procedure called "backwashing". When the water coming through the return inlets reduces, it is time to backwash. If you have a pressure gauge, it will indicate any pressure change. A change of seven to ten pounds above normal is an indication for the need to backwash.

#### **BACKWASH PROCEDURE**

1. Turn off the pump motor.
2. Set valve on filter to backwash.
3. Turn on pump motor. In fifteen to thirty seconds, the water flowing out the backwash line turns dirty. Continue backwashing until this water runs clear again (normally three to four minutes).
4. Turn off pump motor and rotate valve to the rinse position. Turn pump motor on for thirty to sixty seconds.
5. Turn pump motor off and set valve back to filter position. Turn pump motor on.

### **CARTRIDGE FILTERS**

Cartridge filters are cleaned by removing the cartridge and cleaning it. This is necessary when the water flow through the return inlets is reduced or the pressure indicated on your gauge is more than ten pounds above normal operating pressure.

In most cases, you can clean the cartridge by using a pressure nozzle on the end of your garden hose and directing the spray on the cartridge at an angle to remove the dirt. The cartridge can be taken to the car wash and high-pressure spray used. Do not use the detergent on the wax setting, as it will permanently damage the cartridge.

Suntan and body oils will coat the cartridge and cause reduced flow. This material may be removed by using filter degreaser for swimming pool filters. Follow the use directions on the container for this product. Your cartridge filter should be chemically cleaned every three to four months.

Scale will also form on cartridge. This may be removed by soaking the cartridge in a solution of one-part Muriatic Acid added to four-part water. Soak the cartridge until all bubbling action stops.

Always rinse the cartridge thoroughly after chemically cleaning them.

For optimal results, **WaterWorks Pools and Spas** recommends having an extra set of cartridges on hand and rotating out each time. As the cartridge filters dry, the filter fibers shrink allowing for better filtration.

Reassemble the cartridge and lubricate the sealing O-ring to assure a proper seal.

### **D.E. (DIATOMACEOUS EARTH) FILTERS**

D.E. filters are special tanks consisting of a series of cloth-covered grids. Diatomaceous earth, consisting of tiny prehistoric skeletons, is introduced into the filter by the pump and covers the filter element. The D.E. allows water to pass through but collects the smallest of suspended particles. When cleaning is necessary, the water flow is reversed (backwashing) and the dirt and D.E. are seen through a waste line.

### **BACKWASH PROCEDURE FOR DIAL VALVE**

1. Turn pump motor off.
2. Set valve on filter to backwash position.
3. Turn on pump motor. In fifteen to thirty seconds, the water flowing through the backwash line turns dirty. Continue backwashing until this water runs clear again (normally four to six minutes).

4. Turn off pump water and rotate valve to rinse position. Turn pump motor on for approximately sixty seconds.
5. Turn off pump motor and set valve back to filter position. Turn pump motor on.

After the backwashing is completed and the pump motor is running smoothly, the grids must be re-coated with D.E. by slowly adding D.E. into the skimmer basket. The following chart is a recommendation as to how much D.E. should be used.

<b>Filter Size</b>	<b>Pounds of D.E.</b>	<b>Number of One Pound Coffee Cans Needed*</b>
5 Sq. Ft.	½	1
10 Sq. Ft.	1	2
15 Sq. Ft.	1 ½	3
20 Sq. Ft.	2	4
30 Sq. Ft.	3	6
40 Sq. Ft.	4	8
50 Sq. Ft.	5	10

\* A clean one-pound coffee can is a good measuring device for D.E.

At least once each year, the grids inside your filter should be taken out and chemically cleaned. This is accomplished by first soaking the grids in an acidic solution (one-part Muriatic Acid to four parts water) until bubbling stops. The grids are then cleaned with a swimming pool filter cleaner and degreaser. Follow use directions on the containers for these products. Rinse grid thoroughly and reassemble filter.

## **SURFACE SKIMMERS**

Read your factory instructions on operation, maintenance, and warranty.

Your surface skimmer is designed to remove all those things that float on the surface of your pool. They are collected in the basket inside the skimmer. This basket should be periodically removed and cleaned.

## **REPLACING UNDERWATER LIGHT BULBS**

1. Shut off power to pump and light system. Be sure light is off.
2. Remove the screws which hold the light in place.
3. Pull the light out with the niche.
4. Unwrap the cord from around the light.
5. Place the light on the deck.
6. Remove the light bulb and replace it with a new underwater light bulb.
7. Place the light back in the pool and re-screw it to the niche.

**DO NOT TEST THE NEW LIGHT BULB UNTIL THE LIGHT IS REPLACED IN THE POOL. THE LIGHT BULB WILL EXPLODE AND CAUSE THE WHOLE LIGHT FIXTURE TO HAVE TO BE REPLACED.**

## **DECKS, WALKWAYS, AND PATIOS**

Keep all areas, adjacent to the pool as clean as possible. All dust, dirt, debris, etc. on these areas are blown or tracked into your pool, increasing the chlorine demand. Hosing off these areas with water is the accepted method of cleaning them. Keep as much water out of pool as possible.

Pool chemicals in concentrate can etch and/or stain your deck area. Be careful not to spill pool chemicals on these surfaces. If you should spill chemicals on these, be sure to rinse area with large quantities of fresh water.

Occasionally, in the summer months, you may encounter algae growing on the deck area. Should this occur, wash the area with an algaecide solution (one-part algaecide to 8 parts water). Rinse thoroughly after cleaning.

## SWIMMING POOL SAFETY

Like anything new, your swimming pool will be “shown off” to your family, friends, and neighbors. Please consider the following safety facts before establishing your pool rules.

1. Diving and sliding headfirst into the water causes more paralyzing injuries than all other sports combined.
2. Drowning is the second leading cause of accidental death. It is only second to traffic accidents.
3. The LEGAL RESPONSIBILITY of the pool owner is:
  - a. Warn users of pool hazards.
  - b. Protect against misuse.
  - c. Correct unsafe conditions.

It is a good idea for you to review your insurance coverage on your house or property where the pool has been installed and decide whether you have sufficient coverage to cover a lawsuit. Homeowners insurance is much less expensive than automobile insurance and increasingly greater amounts of insurance can be purchased at minimal rates.

Your LEGAL RESPONSIBILITY is to protect against misuse whether you are at poolside or not.

1. Whenever you see someone doing a dangerous activity, you have a responsibility to warn him or her and tell him or her to stop.
2. Never, ever leave a child alone near water, even to answer the phone.
3. Tell every person who will use the pool your pool rules and regulations.
4. Prohibit glass of any kind in the pool area.
5. Post on your phone the rescue or hospital telephone number. Also display a guide for mouth-to-mouth resuscitation and CPR.
6. Learn proper removal techniques of injured pool users.

Drowning is the second leading cause of accidental death. Drowning usually occurs when one or more of the following “no-no’s” occurs:

1. UNSUPERVISED SWIMMING – when a child drowns, an adult is responsible. Never leave a child alone, even for as long as it takes to answer the telephone. A child whose lungs are filling with water is unable to scream for

help. Don't assume that you will be able to hear it if something dangerous happens as there may be no sound at all.

2. UNCOVERED POOLS NOT IN USE – a pool cover serves to conceal the water and discourage a child's curiosity. Also, a pool cover provides some protection to the child or his parent should an unsupervised entry occur.
3. UNPROTECTED POOLS, NOT SURROUNDED BY FENCING – a good fence not only provides privacy, it also ensures against uninvited "guests" when you are away from home.
4. UNLOCKED SAFETY GATES – be sure all fenced pools have self-locking gates. If the pool can be entered from the house, be sure those doors are locked whenever a young child is present.
5. UNACCOMPANIED SWIMMING – never allow anyone (including yourself) to swim alone. Even an experienced swimmer can have an accident.

It may be common that alcoholic beverages are served or consumed in close proximity to your swimming pool. IN this case, conduct of all persons must be closely supervised in a "party atmosphere" or in an environment where alcohol is consumed.

Alcohol is not a stimulant, but rather a depressant. The reason people act "silly" after a few drinks is that the part of the brain, which exercise restraint and control over activities, is being anesthetized and their control will soon diminish.

As the amount of alcohol consumed increases, the more of the brain is anesthetized and eventually one can black out or maybe worse. If your guests consume alcohol and then must drive to their own homes, please use consideration for their welfare and life as well as the welfare and life of others on the road. If you or your guests become intoxicated, please do not use your pool or operate an automobile.

## **WINTERIZING YOUR POOL**

The principle of winterizing your pool is to prevent any frost damage to the plumbing parts. Treating the pool water with the proper winterizing chemicals and covering the pool during the non-swimming or winter months saves time, money and work when it is time to open your pool in the spring. DO NOT

disconnect the filtering system before adding the proper winterizing chemicals, as the chemicals will not be able to distribute throughout your pool.

1. Introduce the proper winterizing chemicals to the pool water. Allow these chemicals to circulate through the pool water before starting the filter.
2. Clean the filter.
3. Lower the water level of your pool to approximately 3" below the bottom of the skimmer opening. This is accomplished with your pool vacuum cleaner, utilizing your filter and pump, and by opening the water line. Make sure this quantity of water is directed to a place that will not run on any property and cause damage.
4. To prevent the plumbing lines from freezing, the water must be removed from the skimmer box and the pipelines, or a chemical agent must be added to prevent the pipelines from freezing. The water may be forced from the lines by compressed air, wet-dry vacuum cleaner/blower compressor, or displaced by pouring POOL ANTI-FREEZE into the pipelines. Note: DO NOT USE AUTOMOBILE ANTI-FREEZE. Then plug up the lines with rubber winterizing plugs, effectively displacing enough water so that the remaining solution will not freeze.
5. Skimmers must be winterized as follows: When this is done, it will expose two holes in the skimmer bottom. The front hole closest to the pool wall leads to the main drain in the pool bottom, or in the case of not bottom drain, this hole leads to the side drain in the wall of your pool. If you had a side drain, put two quarts of pool anti-freeze in this hole and insert a winterizing plug in the hole. Now both ends of this line are plugged and have anti-freeze inside of the pipe. Regardless of what type of drain you have, the other hole in the skimmer leads to the front of the pump at the filter and must have two quarts of pool anti-freeze in this line and plugged in the skimmer. After both plugs are in, pour two quarts of anti-freeze in the plugged skimmer bottom. This will stop any freezing in the skimmer-housing box should any water get into the skimmer. If your pool is piped in any other way than explained previously, make sure that all lines and skimmers are winterized with pool line anti-freeze.

6. Remove all ladders and handrails and store them in a proper place. Place the white rubber ladder bumpers in the anchor socket holes to prevent chafing of the pool cover securing them with tape.
7. Underwater lights remain in place as they are below where ice will form.

### **CAUTION**

When introducing winterizing chemicals as explained previously, take care not to allow these chemicals to settle on pool bottom by allowing them to circulate and dissolve for a few hours prior to removing the pump. Floating chlorine dispensers should be avoided when winterizing a pool. Dispensers are often trapped in one area, allowing the slow dissolving chlorine or chemicals to remain in one place. Which may cause damage in a confined area to the pool surface.

### **THE FILTER TANK MUST BE DRAINED OF ALL WATER**

8. Sand filters have a drain plug at the base of the filter tank. Diatomaceous Earth filters have a similar drain plug or valve at the bottom of the filter tank. This is where the old D.E. is drained before regeneration with the new D.E. powder. Drain the tank completely dry and leave the bottom drain plugs out and/or the valve open for the winter. You can store these plugs and any other small items inside the strainer basket at the pump, so you won't forget where you put them over the winter months.
9. It is advisable to install a winter pool cover on your pool. Install this cover according to the manufacturer's directions. If more than two inches of rainwater accumulate on your cover, it is best to remove the water with siphoning device, so as not to have water displace the pool water under the cover, causing an overflow problem. This will super-saturate the area around the pool and cause undue pressure on the pool sidewalls and components, unaware to you. **FLOAT AN INFLATED TIRE INNER TUBE FOR EXPANSION.**
10. If you have a pool heater, make sure that the heater is drained by removing the necessary plugs as required in the heater instructions as supplied with heater by the manufacturer. **PLEASE FOLLOW THESE DIRECTIONS AND YOU WILL ENJOY YOUR POOL NEXT SEASON.**

## SPRING START UP

1. Clean and rake the area around poolside.
2. Remove the pool cover from your pool and store the cover in a safe, dry place for next year.
3. If you don't have a pool cover, scoop leaves and any other debris that might have accumulated in the pool over the winter.
4. Remove the rubber bumpers that you placed in the anchor sockets for the pool ladder last fall.
5. Using a soft brush, (a clean paint brush will do nicely) brush any dirt out of the anchor socket bolt threads.
6. Wipe a heavy dab of Vaseline or grease into threads of the anchor socket and spread around the inside of the socket. This will help you disassemble the pool ladder at the end of the swimming season. Do the same thing to the socket of handrail, if you have one.
7. Install the pool ladder (make sure the rubber bumpers are attached to the end of the ladder that rests against the pool wall) and tighten the anchor socket bolts gently but firmly.
8. Remove all of your other pool fittings and accessories from storage, clean them off and install them in the pool or at poolside.
9. Remove the coverlid from the skimmer. Remove the winterizing plugs from the skimmer.
10. Install the strainer basket in your skimmer.
11. Install the skimmer lid.
12. Install the pump strainer basket in the pump housing.
13. Install the pump drain plugs in the pump if they were removed.
14. Fill the pump housing with enough water to fill the pump strainer basket.  
This water will act as a prime for the pump (approximately 1 gallon).
15. Lubricate the pump cover gasket or "O" ring and put it in place then put the pump coverlid securely in place.
16. Install the drain plug in the bottom of the filter tank.
17. Open the waste line.
18. Remove the winterizing plug from the return line and screw in a male adaptor connector in the line and put your vacuum cleaner hose onto the male adaptor. Put the other end of the vacuum hose out of the pool.

19. Fill the pool with enough water to reach the center of the opening on the skimmer.
20. Turn pump motor on and let run until the pool line anti-freeze has left the skimmer and the main side drain. You'll be able to tell by seeing the blue or colored anti-freeze coming out of the waste line. When this water runs clear for 30 seconds, the anti-freeze is out of the skimmer and main or side drainpipes.
21. Turn off the motor and close the waste line.
22. Make sure the vacuum cleaner hose is secured to the adapter that is screwed into the return line fitting and the other end of the vacuum cleaner hose is directed to a convenient drain area. Turn the pump motor on. Water and anti-freeze will come out of the return line. When this water runs clear for about 30 seconds, you have removed the colored anti-freeze from the return line. Remove the adapter and the vacuum cleaner hose from the pool and proceed to filter the pool water.
23. Add a triple dose of purifying chemicals to the pool water through the skimmer, not directly to the pool (this is super chlorination of the pool water).
24. With the filter running, brush the walls of the pool. After the dust and dirt have settled to the bottom of the pool, vacuum the pool clean.
25. Start and maintain your normal filtration and water purification schedules. It may take as many as 4 to 7 days of this normal filtration to reach the desired clarity of the pool water if pool got very dirty over the winter months. Do not be concerned, therefore, if it takes a few extra days to clean your pool. If your water purification schedule is well under way and pH is in the proper range, there is no reason why you cannot go swimming during the interval of cloudy water.

In some area of the USA, the water out of the tap contains excessive minerals, such as iron and copper. The necessary addition of chlorine to the water coagulates and turns the water brown and forms a coating on the pool surface. To keep these minerals in suspension and to help prevent this, you must add a sequestrian chemical (water clarifier), as per instructions on the container label. Water should be analyzed periodically to maintain a chemical balance.

## SALT WATER POOL INFORMATION

A salt water pool is not a chlorine-free pool. Salt water pools create their own chlorine by passing slightly salty water through two electrically charged metal plates, called the Salt Cell. Salt pools create chlorine to kill bacteria and germs, the same chemical produced by tablets, liquid or granular chlorine.

Through electrolysis, Salt (NaCl) and water (H<sub>2</sub>O), are converted into Chlorine (Cl<sub>2</sub>), Hydrogen (H<sub>2</sub>) and Sodium Hydroxide (NaOH), as the water passes through the energized salt cell.

When the chlorine molecule (hypochlorous acid, the same chemical produced by chlorine tablets and shock) is used up, the salt is converted back to NaCl, and the process can start again.

### BENEFITS OF A SALT WATER POOL

Salt water pool owners love the soft and silky feel of the water. Salt water pools can often be easier to manage, as many salt system owners report reduced chloramine formation; combined chlorine molecules that smell bad and are eye irritants. Indeed, most users of salt systems report much less chlorine smell, in the water, or on their skin after swimming, and no more “red-eye” swimmers. Some users also claim to have a more stable pH and alkalinity, with less frequent adjustment needed.

### SETTING UP A SALT WATER POOL

Setting up a salt water pool is more than just pouring salt in the pool. Adding salt without using a chlorine generator will only give you salty pool water.

**WaterWorks Pools and Spas** does not recommend swimming in your new pool until it has been tested for to ensure correct sanitization and acidity. Please bring a water sample to your nearest location so that we can test your water using our computerized water analysis system.

It is recommended that salt levels be maintained between 2,800 – 3,500 PPM to keep your Salt Generator working properly. **Please Note:** On a newly built Gunite pool, salt is not added for the first 30 days. During this time, you will need to use Chlorine Tabs in your pool to maintain sanitation.

The type of salt you add to the pool is very important; common, food-quality, granulated salt labeled “Pool Salt” or “Solar Salt” is the best bet. You must never use salt with anti-caking agents, iodized or rock salt.

Add the salt directly to the pool while the pump is running. Brush the salt around to help it dissolve quickly, and let the pump run for at least 24 hours to ensure the salt is evenly dispersed.

### THE REST OF YOUR POOL’S WATER CHEMISTRY

While maintaining the proper salt level of your pool is important to keep your pool in good shape, it isn’t the only aspect of your pool’s water you need to keep an eye on. If you fail to monitor and maintain all facets of your pool’s water chemistry, it could become more dangerous to swim in. There are five aspects of your pool water’s chemistry you must monitor. Checking chemical levels can be done with manual test strips, liquid reagent kits, or electronic devices.

- **Stabilizer (Cyanuric Acid):** This mild acid helps slow the speed at which the chlorine breaks down when under UV sunlight, thus preventing the salt generator from having to overwork. The ideal levels fall between 60-200 ppm.
- **Total Hardness (Calcium):** Water hardness is a measurement of the total mineral content of the water. Harder water has more minerals, which can slowly build up. **High calcium** will form scales on the pool walls, in the piping and in the filters, clogging these systems, reducing the flow of water and decreasing the efficiency of the filter. **High calcium** can also cause cloudiness that will not change, and even irritation to eyes and skin. **Low calcium** levels in a plaster pool will cause the water to draw calcium directly from the plaster, causing it to pit, become rough, and eventually crumble. **Low calcium** contributes to vinyl pool liners losing their elasticity and supple nature, thus shortening the life of your liner. Metals (everything from rails, to heat exchangers on heaters) will slowly begin to corrode. The ideal level is between 200 and 275 ppm.
- **Total Alkalinity (Sodium Bicarbonate):** Your pool water’s total alkalinity is connected to its pH levels. Low alkalinity leads to more caustic water that can degrade metal equipment over time and can cause discomfort to your skin and eyes. Alkalinity that is too high

lowers the effectiveness of chlorine. The ideal level is between 80 and 125 ppm.

- **pH:** The pH scale runs from 0 to 14, denoting how basic (alkaline) or acidic a substance is. Seven is neutral; higher than seven is basic and lower than seven is acidic. It's best to try and keep the pH level of your pool between 7.2 and 7.6, meaning neutral.
- **Chlorine:** There are three different types of chlorine in your pool, and not all of them are "good" forms.
  - **Free chlorine** is the chlorine that is available to combine with contaminants in the water to disinfect and sanitize the water. Chlorine that is added to swimming pools is "free" chlorine, in that it has not yet bonded with nitrates, ammonia or other compounds in the dirty pool water. Free chlorine to treat a pool can come in liquid form, tablet form or granular form. The only difference between these types is the material that is bonded with the chlorine. In liquid forms, the chlorine is bonded with sodium, while solid forms (tablet or granular) may use calcium, sodium or potassium as the bonding agent. Free chlorine should be maintained at 1 to 4 PPM.
  - **Combined** chlorine is chlorine that has done its job by binding with contaminants; it is still found in the pool water but is no longer available to do its job as a disinfectant and must wait for additional chlorine to come in to continue to disinfect the water. This combined chlorine, called chloramines, is what gives swimming pools their characteristic chlorine odor. Though people think this condition is caused by too much chlorine, it actually means there is not enough free chlorine. Paradoxically, the smell of chlorine in the water means that more free chlorine should be added. Combined chlorine should be less than 0.5 PPM. Combined chlorine levels higher than that indicate a need to shock the pool by super-chlorinating it.
  - **Total chlorine** is a measurement of the total amount of chlorine in the pool — that is, the sum of both the free "available" chlorine and the combined chlorine that is holding the dirt, oils and other compounds that make pool water dirty and foul-smelling.

## BENEFITS OF SHOCKING A SALT WATER POOL

It's absolutely okay to shock your salt water pool, and is actually pretty important!

Even though your pool system is probably equipped with an electrical function to super-chlorinate the water, it should not replace a weekly shock treatment for a couple of reasons:

1. Running your pool's super-chlorinate feature too often is hard on the motor and will cause it to wear out faster.
2. The super-chlorinate feature will not always kill all the algae or clean up the pool water as effectively as pool shock.

## WHEN SHOULD YOU SHOCK A SALT WATER POOL

I always recommend shocking any type of pool once a week, but there are a few reasons to shock your pool even if you're not in this habit:

1. **To remove algae:** Chlorine is the most effective treatment to kill algae—black algae, a green pool, etc.—and it's best to kill it at the first sign of a bloom. Whether you notice small spots or a complete overgrowth, it's time to shock the pool. For tough algae, be sure to scrub the spores off the pool surface first and then vacuum up when you're finished.
2. **To remove chloramines:** As the free chlorine is used up and combined with contaminants to become chloramine, or combined chlorine, more free chlorine in the form of liquid, tablet or granular chlorine must be added. When water problems arise in swimming pools, such as algae growth or cloudiness, this means that the level of combined chlorine has become excessive. The solution now is to "super-chlorinate" or "shock" the pool, which means adding 10 times the normal amount of chlorine generally used. This kills all the pool's bacteria, which is then extracted through the filter.

## IMPORTANT POOL SERVICE NOTES

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### 1. **Salt Cells**

- At 65°, the Salt Cell will go into Winter Mode. This means it will stop generating chlorine. If the pool remains open for the winter, it is recommended to unplug your Salt Cell and put a Dummy Bypass Cell in its place to prevent the cell from freezing.
- Salt level needs to be at 3,400 ppm to produce chlorine. As long as the strip is within 500 ppm (+ or -) it is still producing chlorine. If it is lower than 3,000 ppm, it is recommended to bring the salt level up so that it doesn't take so much to keep it balanced.
- Pouring shock through the skimmer with the cell hooked up will eventually ruin the cell.
- IC15 uses a one 3-amp fuse.
- IC 20, IC 40, and IC60 use a 10-amp fuse.
- With an IntelliFlo Pump, replace the fuse with a 12-amp ceramic fuse. (This will not matter if they have an Easy Touch Automation Panel)
- If the cell has no lights on, it's usually the fuse. If the fuse doesn't work, it could be that the Power Center is bad.

2. **Valve Actuator** – Do not flip the switch, they are set where they need to be for proper water flow.

3. **GFCI** – If the pool lights aren't working, check the GFCI to see if it has tripped. If that doesn't work, check the breaker. (GFCI has a test/reset button that needs to be pushed if tripped)

4. **New Gunite Pools** – Do not add any balancing chemicals other than shock and chlorine tabs for 30 days after the plaster is done or until the curing step is complete. If you do not wait, it can cause an expensive problem.

## 5. Heater

- If a pool has a heater, and no way to bypass it, then do not pour shock thru the skimmer. The inside of the heater is made of soft copper tubing that will be easily broken down by chlorine.
- Heaters with Automation – Heater needs to be set to 104°F, so that the desired temperature will be controlled by the homeowner's remote.

## 6. Leaks

- Pump Seals – If the pump is leaking between the pump housing and the motor, most likely the mechanical seal needs to be replaced. If this ever happens, take a picture of the pump so we can get the correct seal.
- If pool is leaking, always check pump/filter area and waste line first, the diverter gasket on the filter may need to be replaced.