

YOUR INDEPENDENT HOT TUB SOURCEBOOK SINCE 2001

# Spasearch

Hot Tub Buyer's Guide SPECIAL REPORT

## Simple tricks for sparkling clear spa water

Spa Chemistry 101: What you need to know  
to keep your spa water clean

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# Chem 101

BUCKLE INTO THESE BASICS OF KEEPING YOUR SPA WATER CLEAN.

**CARING FOR YOUR SPA** water doesn't need to be intimidating. Even if you do run into some bumps in the road, your dealer will be there to help you every step of the way.

## BASIC CHEMICALS

There are four main goals to efficient and safe water chemistry: Kill bacteria, provide bather comfort, eliminate scaling and prevent staining. All four can be achieved by maintaining water balance, using a few commercially available products and a couple minutes each week for diagnostic testing.

### Killing Bacteria

Normally, spas or hot tubs use either bromine

or chlorine to sanitize water. Both products are available in granular or tablet forms, which are added to the water as directed by the manufacturer.

Bromine tends to be a more popular choice for spa use because it has a less offensive odor, despite being more expensive. Chlorine has long been proven as an effective and economical method to sanitize spas.

### Personal Comfort

An important factor in maintaining cleanliness and comfort with your water is pH, a measurement of how acidic or alkaline (basic) the water is relative to distilled water, and is measured on a scale of 0 to 14. Numbers below 7.0 indicate acidity while numbers greater than 7.0 indicate alkalinity. Maximum

comfort is achieved at a pH of 7.5 or slightly alkaline on the pH scale.

On the other hand, water that is low in pH can destroy the total alkalinity content in the spa water. When this occurs, minor adjustments in pH can have dizzying effects due to the water having very little buffering effect, or resistance to changes in pH. Have two products on hand and test for each: one to raise pH, the other to increase total alkalinity.

Since a newly installed spa is most likely filled with municipal or well water of an unknown pH level, a simple test will determine how to initially treat the fill water. If the fill water records a higher pH than the recommended 7.4 to 7.6, it is considered alkaline, or base, and will require an acidic additive to lower the pH into range. Conversely, if the fill water is lower than a pH level of 7.4 to 7.6, then it is acidic. If your water requires adjustment, your neighborhood spa store sells products such as “pH up” and “pH down” to bring your spa water back into the recommended range.

### Eliminating Scaling

Imagine if the spa were as difficult to keep clean as your shower door. This pesky buildup was deposited as a function of shower water being high in mineral content and high in pH. In spa water, keeping pH in the desired

range keeps minerals from plating out at the water line unless water is extremely full of minerals. To minimize spa scaling, your spa retailer has products designed to remove minerals from water effortlessly by chemically cementing them into a size that can be filtered out, a process called flocculation or chelation.

### Preventing Staining

Somewhat related to scaling, spa staining can occur by aggressive water attacking the spa finish and equipment. Specific common causes of staining include acidic supply water and over-applying chemicals. Either way, the effects of aggressive water can be rapid and permanent, so be sure to let your local spa dealer know about any visual evidence of staining as soon as it is detected.

### Life of Spa Water

As with most natural products, spa water has a shelf life. Most manufacturers agree three to four months is the recommended refill frequency or hot water cycle for a spa used on a regular basis. Periodically refilling your spa

### ALKALINITY & PH

The total alkalinity measurement in the spa should be between 80 and 120ppm, or parts per million. If TA is kept at the upper end of the scale, pH has less of a tendency to bounce around, or change from test to test. It is therefore a good idea to balance alkalinity before pH. Ideally, a stabilized TA has a pH of 7.5. The spa store can recommend a product to perform this function based on your water conditions.

## WHAT TO DO

### Chemical Schedule

Chemical schedules depend on the amount of time you spend in your hot tub. It can also change with the number of people using your spa. If you are frequently using your tub you may want to try a program that involves three-day or weekly chemical schedules. Recommendations vary by company.

### Chemical Start-Up

Take the following steps to get your hot tub water ready for first-time use:

1. Begin by filling your hot tub with water to the specified level.
2. While the tub is filling, test the water for the pH, total alkalinity, calcium hardness and stain producing metals.
3. Add a sequestering agent once the water has been tested, but don't make any other adjustments at this time.
4. Once the hot tub is full, start the pump and filtration system and allow the water to circulate for 24 hours.
5. Test the pH and total alkalinity levels again. Balance the water so they are within normal range. At that time, you may want to use a pH lock product to prevent fluctuation in both levels between refills.
6. Shock treat the water using a nonchlorine shock.
7. Add sanitizer to your hot tub according to the manufacturer's guidelines.
8. pH, total alkalinity and sanitizer levels should be tested and maintained at proper levels. Drain and refill your tub every three months or as needed to ensure quality water.

### Water Testing for Everyday Use

If you use your hot tub daily, test the water frequently to ensure a proper chemical balance. You may also want to shock your water once a week for preventative maintenance.



**Spa-By-Three Rule**

A good rule of thumb to determine if your spa is ready for new water is to divide the spa gallonage by three. Then divide this result by the average number of bathers per day. The final results are the estimated number of days between water changes for a properly maintained hot tub. For example, a 600-gallon spa divided by three equals 200. If the spa averages two users a day,  $200/2 = 100$  days between refills.

Hot tubs are among the most relaxing and healthful products being sold on the market today. Their care is remarkably easy with simple chemical additions, routine testing and the assistance of a reputable spa retailer.

**THE NATURAL WORLD**

There has been a growing emphasis on becoming more environmentally friendly, and it is almost as if every consumer market has something green to offer — cars, cleaning supplies and even hot tub chemicals.

it comes time to maintain your hot tub. Follow the manufacturer directions for storage and disposal of chemicals.

When it comes to buying natural products, many consumers are wary of added expense. However, these products are becoming more and more cost effective.

A number of companies now offer a wide array of systems that fit into any lifestyle, so we have compiled a list of some that may suit your needs on the previous page.

**SALTWATER SYSTEM**

“In the portable spa industry, one of the biggest barriers to a consumer purchase is the concern that hot tubs require ongoing water care maintenance. The ACE system allows consumers to more easily care for their spa with fewer bottled cleaners — for cleaner, softer water,” says Kacy Rivers, brand manager at Hot Spring Spas.

Similar to saltwater pool systems, the ACE system uses salt, water and an electrode to sanitize the water. There is one marked difference with the ACE system, though.

“Other saltwater systems, like those designed for pools, rely on the energy from titanium electrodes to create chlorine to clean and sanitize the water,” Rivers says. “The ACE system uses a diamond electrode along with two titanium electrodes. The special diamond electrode increases the sanitizing power while using less salt. It generates five different cleaners instead of only chlorine. The system requires only a very low level of salt compared to other saltwater systems, minimizing the risk of corroding hot tub components.”

When the diamond electrode is energized, it breaks apart water molecules to create active oxygen — one of the world’s most effective natural cleaners. When combined with salt and other elements in the water, active oxygen creates chlorine and three other powerful oxidizers: ozone, hydrogen peroxide and MPS.

The topside control panel asks you simple questions to help ensure the ACE system provides the correct level of cleaning. For everything to work as it should, the water must be properly balanced, which requires regular testing and use of some chemicals. But the need for those extra chemicals is dramatically reduced compared to hot tubs that don’t have the ACE system.

The ACE system is available on all Hot Spring hot tubs built on or after August 2009.

Hot Spring isn’t the only manufacturer that has developed salt systems for their hot tubs. Ask your local hot tub retailer what its manufacturer offers.

**TOP PRODUCTS:  
CHLORINE-REDUCING CHEMICALS**

**ACE SALT WATER  
SANITIZING SYSTEM**



[HOTSPRING.COM](http://HOTSPRING.COM)

Using a diamond electrode, the ACE Salt Water Sanitizing System generates five sanitizers to cleanse your spa, including high energy active oxygen. The active oxygen is the first way the ACE system cleans the water. Once the water is clean, the active oxygen combines with a little bit of salt to produce four more cleaners – chlorine as well as ozone, hydrogen peroxide, and MPS. To get started, add the appropriate amount of salt to balanced water. Using the menus on the spa’s main control panel, enter the spa’s size and expected use level. Then simply check the sanitizer level regularly with a test strip and confirm your use level monthly. Since the ACE system automatically generates cleaners, you’ll have fewer bottled products to measure and pour.



**SILKBALANCE**  
[SILKBALANCE.COM](http://SILKBALANCE.COM)  
**360-392-2832**



Efficiency and simplicity are the main highlights of SilkBalance, a one-step water care program by Silk Water Solutions, USA, Inc. The Bio-film Dispersion Technology works to remove all slimy/scummy substances that form in the water and plumbing including the removal of calcium deposits. This advanced technology also reduces the need for sanitizers while automatically balancing pH and alkalinity levels in your tub.



## WATER QUALITY — H2O HICCUPS

Most sanitation and filtration systems do a fantastic job of maintaining water quality. But even with the best equipment, occasionally you may have to address water clarity.

### Normal Water

Continue to test your water and follow your normal chemical schedule.

### Clear Green Water

High copper or iron content: Add a solution that decreases minerals in the water.

### Cloudy Water

*Lack of sanitizer:* Shock-treat and check and adjust sanitizer levels.

*Chemical solids dissolved in water:*

Use a clarifying agent to help remove build-up of particles.

*Imbalance of pH or total alkalinity levels:* Test levels and adjust as needed using appropriate solutions.

*Hard water:* Use weekly treatment and replace some water with new water.

*Dirty filter:* Clean and/or replace filter.

### Cloudy Green Water

*Low alkalinity level:* Use an agent that will raise the alkaline level in your spa.

*Low sanitizer level:* Shock-treat, then check and adjust sanitizer levels.

### Brown Water

*High iron or manganese content:*

Add a solution that decreases minerals in the water.

### Deposits

*Scale Deposits*

*High mineral content:*

Add a solution that decreases minerals in the water.

*Imbalanced water:* Test water balance and make adjustments.

### Waterline Deposits

*Natural build-up of oils and dirt from bathers:* Clean spa surfaces with a cleaning solution and use a scum reducing agent.

### Odor

*Large amounts of organic contaminants:* Shock treat and check and adjust sanitizer levels.

### Foaming

*Natural build-up of oils and dirt from bathers:* Add a solution that will lower foam levels, then shock-treat.

*Soft water:* Test the calcium level and add a calcium-enhancing product to the spa.

*Excessive amount of dissolved solids:* Drain hot tub and fill with fresh water.

### Eye/Skin Irritants

*Chloramines or large amounts of organic contaminants:* Shock-treat and check and adjust sanitizer levels.

*Imbalance of pH or total alkalinity levels:* Test levels and adjust as needed using appropriate solutions.

## OZONE

An ozonator, also known as an ozone generator, creates ozone gas to help sanitize your hot tub.

Ozone is created when oxygen molecules are split by a high-energy electrical discharge, resulting in two individual oxygen atoms. Those individual oxygen atoms unite with remaining oxygen molecules to produce a three-atom molecule of ozone gas. The weak bond holding ozone's third oxygen atom causes the molecule to be extremely unstable and thus, a very effective oxidizer.

An oxidation reaction occurs upon any collision between an ozone molecule and an organic molecule or substance, such as bacteria, viruses, fungus and algae, where the oxygen atom held by the weak bond splits off and only oxygen is left behind. Ozone is actually a gas manufactured by this method, created inside a chamber, housed in various styles of containers.

There are two types of ozonators used in hot tubs. One style produces ozone using an ultraviolet light. Oxygen passes by the ultraviolet light, which immediately separates those atoms we talked about previously. The second style produces ozone by something called Corona Discharge, or CD. This is actually a chamber inside the container that creates little electrical charges to split the atoms. Corona Discharge is the most recent form of ozone gas production. The cell inside the chamber has a longer operating life (about five years) than the ultraviolet style, which has an operating life of about one year.

Mike Cook, owner of Ace Spas in the Washington, D.C., metro area, has run a successful hot tub business for more than 10 years and recommends ozonators to his customers.

“With the use of an ozone system, the spa takes care of itself when you're away on vacation so you don't need someone to check in on your spa,” Cook says. “Many systems work 24 hours a day, so your water always stays clear.”

What should you look for when you're out shopping? “Spas that have an automatic default on them, so that when you turn the jets on the ozonator automatically goes off,” Cook says. “Because the ozone gas is a powerful oxidizer, it cuts your chemical use down quite a bit and you will not have the smell of chlorine on your skin when you get out of the hot tub.”

Ozonators have become so popular that many hot tub manufacturers add them as a standard feature. And even if you already have a hot tub, there are several after-market models available and plenty of service technicians who can install them.

Karen Rigby, technical services senior specialist at BioGuard, says all maintenance would be similar to that of a traditional hot tub. Just like regular spas, she says, you will need to maintain a sanitizer or disinfectant residual, the swim spas will require routine oxidation and you will have to watch water replacement. The number of bathers will also have an effect on the adjustments you should make when maintaining the water. ●

**Diamonds**  
are a hot tub's  
**best friend**

**ACE<sup>®</sup>**

**Salt Water Sanitizing System**

**Exclusive! Only Hot Spring<sup>®</sup> has the ACE salt water sanitizing system with diamond technology**

- **Luxurious spa water.** The ACE system keeps your spa water sparkling clean, silky soft and even smelling great!
- **Diamond technology.** Using a patented diamond electrode, the ACE system automatically creates cleaners from a small amount of salt in your spa water.
- **Save time & water.** Spend less time maintaining your spa and enjoy more time between water changes.



*Owning and enjoying your very own  
Hot Spring spa has never been easier!*

Visit your local Hot Spring Dealer today • To learn more visit: [HotSpring.com](http://HotSpring.com)



Scan to learn more about the exclusive ACE system and the Hot Spring Spas providing the **Absolute Best Hot Tub Ownership Experience<sup>®</sup>**



**HotSpring<sup>®</sup>**  
*Portable Spas*