



THE HOT TUB HANDBOOK

A Guide to Spa Water Care



GETTING STARTED

Start with Better Water

The better the water is that you fill your spa with, the fewer struggles you may endure and the easier the water will be to balance and maintain. Using a hose pre-filter such as the X10 Water Filter is a great way to do this.

Ensure Sufficient Filtration

Most spas come from the factory programmed with default filtration times that are insufficient. This can lead to the use of more chemicals and poor water quality. Make sure that your filtration settings are scheduled for filtering at least 6-8 hours a day. If your spa utilizes a low-volume/low-speed hush pump (often referred to as a 'circ' pump) ensure that it is filtering 24/7. If you are unsure of your tub's filtration system, check your manual or consult your dealer.

Use Spa Marvel

Spa Marvel will allow you to operate your spa with significantly fewer chemicals than you would without Spa Marvel, making your hot tub experience more enjoyable and water care much easier. Spa Marvel also has properties that condition your skin, leaving it feeling so soft and supple, that people with skin conditions like eczema and psoriasis often find that their condition improves when using Spa Marvel. One bottle of Spa Marvel treats all spas up to 500 gallons (2000 litres) for 3 months, and a swim spa for 1 month.

Water Care Basics

There are three main components to water care:

- 1 Water Balance
- 2 Sanitation
- 3 Filter Care



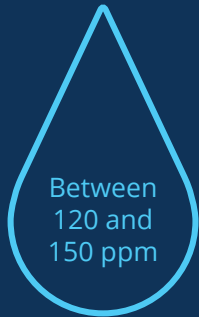
WATER BALANCE

The three main components to water balance are: Alkalinity, pH and hardness.

Testing Water Balance

There are 4 common ways to test your water balance.

- 1 TEST STRIPS** The most commonly used and fastest method is to use test strips. These strips use litmus paper that is dipped into the water and then matched against a colour legend to determine different readings. Most test strips test for the basics: pH, alkalinity and free sanitizer. Some will test for more including cyanuric acid, total chlorine and hardness.
- 2 TITRATION** This is where drops of a reagent are added to a water sample and the corresponding colours are compared to a chart to determine the readings.
- 3 ELECTRONIC TESTING** There are several electronic testing devices available.
- 4 WATER LAB TESTING** These tests are typically done at a professional spa retailer who is equipped with high-tech equipment to analyze the water sample.



Alkalinity

Your water's alkalinity needs to be between 80-150 ppm, ideally between 120-150.

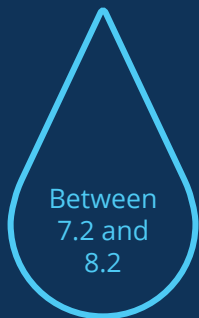
If alkalinity is too high it will cause cloudy water and can cause calcium and gypsum that may be absorbed in your water to precipitate out of solution and make the spa walls feel gritty or have a film that looks like drywall compound on them.

If alkalinity is too low, it will cause foaming, damage to your spa's equipment, and bather discomfort; bathers will start to itch and may even breakout in rashes.

If alkalinity is either too high or too low, sanitizers such as chlorine and bromine do not work as efficiently. In some cases, they may only be 10% efficient which means you have to add 10 times as much chlorine/bromine when the alkalinity is not balanced, as you would if it were balanced.

To lower alkalinity use pH reducer. To raise alkalinity, use alkalinity increaser.

You should check the alkalinity reading every 1-2 weeks, and adjust it if and as required.



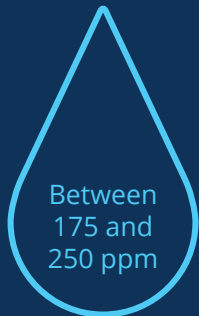
pH

Look at the pH AFTER the alkalinity is in the proper range.

In traditional spa water care, pH is recommended to be between 7.2-7.8, but with Spa Marvel the pH range is broader; pH is fine between 7.2-8.2, as long as you are using Spa Marvel and the alkalinity is in the correct range.

The reason for this broader acceptable pH range is that Spa Marvel reduces the surface tension of the water. When surface tension is reduced, pH will naturally rise a little bit. pH that is high due to this natural rise will not cause cloudy water, reduced sanitizer efficiency, scaling, odours, or anything untoward as it can in traditional (non-Spa Marvel) water care.

To lower pH, use pH reducer. To raise pH, use pH increaser. When using Spa Marvel, it is very rare that you will need to adjust pH, as long as the alkalinity is in the proper range. Again, do not worry about the pH readings until alkalinity is in the proper range.



Calcium Hardness

Calcium hardness is a measurement of how much calcium is dissolved in your water. The biggest concerns are that if there isn't enough calcium (the water is soft), you can experience excessive foaming and the water may feel sticky on your skin.

If calcium hardness is too high (the water is hard), it can create scaling in your hot tub, similar to the white scale buildup you see in shower heads and tea kettles. The good news is that Spa Marvel does a great job at preventing scale build up from forming, so you do not need to worry about hard water when using Spa Marvel. Additionally, if you fill your spa using the X10 Water Filter, the X10 will alter calcium in the water to a form that will not cause scaling.

Calcium hardness should be between 175-250 ppm. To increase calcium hardness, use calcium hardness increaser. There is no easy way to lower calcium hardness in spa water.

If you can, fill your spa with soft water from a water softener, then increase the calcium hardness to the 175-250 ppm range with calcium hardness increaser.



SANITATION

To maintain a biologically safe environment for bathers, hot tub water requires mechanisms to kill and prevent the growth of bacteria and other pathogens. The products used to do this are known as sanitizers, the most common sanitizers being chlorine and bromine.

Spa Marvel does some of the work that chlorine and bromine can do, but Spa Marvel does not sanitize; it doesn't attack and kill bacteria the way a sanitizer does. Rather it naturally removes the food necessary for bacteria to live. This is in part how aquariums and lakes can maintain themselves without needing a sanitizer added to them.

Since Spa Marvel is doing some of the work that chlorine and bromine would otherwise do, it will take less chlorine or bromine to maintain the desired readings when using Spa Marvel, than when not.

It is generally recommended to maintain sanitizer readings between 3-5 ppm in residential spa applications. There are so many variables in spa water care that it is impossible to prescribe an exact amount of sanitizer to use, but when using Spa Marvel, a good guide for adding chlorine or bromine granules is to use the ratio of 4 teaspoons per 250 gallons of water (20 grams per 1,000 litres) on the initial fill, then add 1 teaspoon (5 grams) to the water each time you are finished using the hot tub. If you are using chlorine or bromine in a tablet form, using 2 tablets a week in the dispenser is a good place to start. Your professional spa retailer can provide you with the best product and form of sanitizer to use.



Absentee Spa Owners

Spa Marvel is a favorite amongst absentee spa owners: People like cottagers and vacation home owners whose spas are not being used and who may not be available to add sanitizer for weeks or months on end. Spa Marvel will maintain the water during their absence, even though no sanitizer has been added.



Effects of Sanitizer on Alkalinity

As sanitizer is added to the water it turns to acid. The acid will lower your alkalinity, slowly making the water more acidic. It is important to check your alkalinity reading on a regular basis to ensure that it is in the ideal range, and to adjust it as required. If you don't, as time goes on the water will become more acidic and cause increased consumption of the sanitizer, foamy water, can cause the bathers to itch and develop rashes, and can damage your spa's equipment.



Chloramines & Bromamines

After sanitizers have done their work breaking down contaminants and become exhausted, they are converted to a form that doesn't do anything except sit in the water and expel odours. In other words, when a chlorine molecule cannot do any more work, it becomes what is known as a chloramine (bromine becomes a bromamine), and chloramines give off the chlorine-smell that is so often associated with pools and spas. In other words, when you can smell chlorine, you are actually smelling chloramines, which is the chlorine that has been exhausted and is not doing anything to keep the water safe.



Shocking the Water

To get rid of the smell, you need to get rid of the chloramines/bromamines. The way to do this is to add a large dose of something that will break them down. This is called 'shocking the water'. "Shocking" is a term used to describe the addition of a large dose of an oxidizing agent to the water. The oxidizing agent will break down contaminants that are too small to be filtered out of the water that can cause hazy water and odours, including chloramines and bromamines. Oxidizing agents include bromine, chlorine and non-chlorine spa shock. To sum this up, if you smell chlorine, it is a sign that you actually need more chlorine (or bromine or non-chlorine spa shock.)

Once a week, shock the water by adding chlorine or bromine granules to the water at the ratio of 4 teaspoons per 250 gallons of water (20 grams per 1,000 litres). If the water is in any way not clear, increase the dosage to 2 tablespoons per 250 gallons of water (30 grams per 1,000 litres). If you are using a non-chlorine shock, follow the directions on the package.

It is perfectly acceptable to shock the water more frequently if necessary. For example, if after the spa has had a large bather load and the water wasn't crystal clear, shock the water to help get everything cleared up sooner.



Clarifier

Sometimes contaminants can be introduced to the water that are so fine that they pass through the filter and stay in suspension, leaving the water looking hazy. If a clean filter and shocking the water will not remove these contaminants, then using a water clarifying product from your professional spa retailer will help. The clarifier sequesters the fine particles that are causing the haze and clumps them together so that they become a larger particle and can get trapped in the filter media.

FILTER CARE

Thorough and frequent filter care is **CRITICAL** to maintaining the quality of your spa water. You can do everything else correctly, but if you don't keep your filters clean, you will be struggling with cloudy water, odours, and the excessive use of chemicals.



Spa filters capture debris introduced to the spa water by the bathers, including hairspray, makeup, deodorant, perfume, lotions and creams, along with human waste, including body oils, sweat, and residual urine, feces and blood. Properly cleaned filter cartridges are essential to successful spa water care. Dirty filters will put strain on your pump, may shut down your power pack, and can cause cloudy and smelly water.

There are two basic kinds of filters, disposable filters, which cannot be cleaned and are to be disposed of when they are no longer effective, and the more popular pleated fabric filters, that are designed to be cleaned as required, and replaced after multiple uses. This section refers to the latter of the two, the pleated fabric type.

People often ask "How often should I clean my filter"? Which is a lot like asking "How often should I wash my car"? A car that sits in a garage in Southern California that is only driven on Sundays will need to be washed a lot less frequently than a car that is being driven daily in New York City in the winter time. The Southern California car might go a year without needing to be washed, whereas a car in NYC in a snow storm might need to be washed every few hours to keep it clean.

Similarly, hot tub filter cleaning frequency is a function of use. For example, if the spa is at a vacation home that is only used once a month by two people who shower thoroughly before using the spa, the filter will go months before needing to be cleaned. On the other hand, if the spa is at a home where a family of 5 uses it daily without showering beforehand, the filter will require more frequent cleaning, possibly every week.

Additionally, filters come in different sizes and capacities. Filter size is measured in square feet, which is the measurement of the surface area of the filter fabric. The physical size of 2 filters may be identical, but the square footage of the fabric on one may be double the other, which means that the filter can go twice as long before needing to be cleaned.

Filter quality is also a consideration; not all filters are created equally. Using a quality filter recommended by your professional spa retailer will yield better results, helping to maintain clearer water for longer periods of time.

Filters are not magic; they need to be maintained. For example, if on the first day of using a brand new filter a bather covered in sunscreen were to use the spa, the sunscreen will wash off of their skin and can impede the efficiency of the filter so that it won't work well and will fail to pick up other debris. Then the spa goes cloudy, even though the filter is brand new. The filter may look clean, but the tiny holes in the fabric get clogged up and won't perform well. Add all of the shock and clarifier you want to, if the filter is dirty, your water will remain cloudy.

To properly clean a filter, use a spa filter cleaning product such as Spa Marvel Filter Cleaner.

If your current cleaning method is to simply rinse your filter with fresh water, that is akin to washing your hair without shampoo. After 1 day you'll know you didn't use shampoo, and after a week everyone around you will know. After soaking the filter in filter cleaner it is critical that the debris is thoroughly removed from the pleats of the filter by using a strong stream of water like you would from a garden hose sprayer. If after rinsing your filter the fabric does not appear brand new, i.e. there is still discoloration in the pleats or if it still smells dirty, then it is not clean and you need to reevaluate your current filter cleaning techniques. Many people gently and carefully use a pressure washer to quickly and effectively remove the debris after soaking the filter. Keep in mind that a pressure washer has the ability to peel paint from a car, and similarly can damage the fabric on your filter, so use common sense when using a pressure washer. If you do not have access to a pressure washer, the sprayer at the coin-operated car wash works well.

A thorough filter rinse once a week with fresh water to remove heavy debris and discoloration, combined with a proper complete monthly deep-cleaning, will maintain the filter cleanliness for the majority of hot tub users. Your filter can never be too clean and it is MUCH easier to keep a filter clean than it is to clean a filter.

Filters don't last forever. While they may look fine to the naked eye, by nature they wear out and lose efficacy as they are used and cleaned. For example, a one-year old filter might allow twice as much debris to pass through the filter fabric as it did when it was new, which will impair water quality. Hot tub filters ought to be replaced after at most 1 year of use, or a dozen cleanings, whichever comes first.





CHANGING THE WATER

As chemicals are added to spa water, the water becomes more saturated. It is a good practice to replace your spa water every three months. When using Spa Marvel, you are using fewer chemicals than in traditional spa water care, so if a situation arose where the spa water could not be changed at the three month point, i.e. maybe the weather is too cold to permit a water change, simply add another bottle of Spa Marvel to the existing water and carry on for another 3 months. In a swim spa, use one bottle of Spa Marvel per month, and change the water as frequently as your professional spa retailer recommends.

A plumbing cleaner such as Spa Marvel Cleanser should be used prior to each water change.



NOTES

- When adding chemicals to your spa water, follow the directions on the package.
- **This is a basic guide to water care.** If you have questions, consult your professional spa retailer for more advice, and/or see the resources available at spamarvel.com/water-wizard.
- Read your new spa owner's manual.
- Four people in your hot tub is the same as 200 people in a swimming pool. The bather load in a spa is tremendous. If you don't shower thoroughly before using the spa, you are using it as a bath tub. Hairspray, makeup, deodorant, perfume, cologne, gel, detergents/soap, lotions, and creams are introduced to the water. Those are on top of the sweat, body oil and residual human waste (fecal matter, urine and blood) that often accompanies bathers into the water. This is hard on the water, your water treatment chemicals and your filter. By showering **THOROUGHLY** before using your spa, your water quality will improve, you will spend less time caring for your filters, and your life will be much better.
- Use proper water care products to maintain your investment and to maximize your enjoyment. Do not use vinegar and bleach to maintain water balance, those products are for French fries and laundry, not hot tubs. Use products designed for hot tub care; you will find a higher-quality product when buying from a professional spa retailer than you will when buying from a big box store. Lower quality products may cause excessive foaming and lead to more frequent water changes. Do not use essential oils, tea-tree oil and other products not designed for hot tub use as they often gum up the filters and cause cloudy water and foam.