



**Your Hot Tub
Friend or Foe?**

Presented by

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Now you own a hot tub. That's great! No really! I'm serious... I know you've had some enjoyable moments in it, but now it's time to deal with the unavoidable facts. Your hot tub water is cloudy, smelly and it's probably a strange color. Those test strips aren't helping much. You called or stopped by some hot tub company and they convinced you to buy another concoction of their magic fix-alls. Your mind is hazy because that clerk seemed to be rushing you, something about another customer and a new tub sale. You arrive home and try to figure it all out. Did they say to add a capful or was it 1 tablespoon of that other stuff? Were you supposed to pour the whole bottle or was it half? Why does it have to be so complicated? You continue to battle the chemistry and the water still seems to be the same witch's brew of strange colors, smells and you've wasted more time and energy than you have ever seen **in** the tub relaxing! So now what? You might have even done what a lot of people do. You just gave up and went back to staring at your tub. Now it's just a big expensive ornament on your deck or patio that is a painful memory covered with a tarp. STOP! This is not the way it's supposed to be! Dust it off, chase away the frogs, snails and slugs and let's take a good look.

Water... The one key element of the illustrious hot tubber that's the most abused and neglected! The last thing we "hot-tubbers" want to do is spend our free time trying to get the tub ready. We just want to jump right in and... "ahhhh, relaaaax.... ohh, that feels so good on my sore aching muscles". But wait! Now I'm itching and what's that red splotchy rash? I put stuff in it several days ago, or was that last week? A little of this and dash of that! Isn't that good enough? Hold on... before you kick your sandals off and dive in feet first let's talk about that water your going to soak in. Ok, you filled it up last month from the same hose your dog drinks from. That's fine. It's probably the same water you drink too (maybe not from the hose). And it's not making you sick drinking it, now is it? Well let's stop and look at that water... Tap water is treated before it gets to you and while some of us might not like the taste, that tap water is clean and free of any nasties that might affect you. So you filled your hot tub with it and it looked just perfect... nice and clear, no smells, just right! STOP! WAIT! HOLD ON! Let's take another look. While it might look okay and smell okay right now, it's not going to stay that way long. You just finished digging in the garden and stuck your hand in the water as you walked by, to feel whether it was warm enough yet as you headed to the bath to cleanup before you get in the tub to relax. (Zooming in to Microscopic view) There's some alien looking bacteria crawling on your hand. It just washed off your hand and... Oh, my gosh, look how cute! It's got its hot tubbing outfit on... Geez, it's not alone... hey... look... there are hundreds of them! Hey, they're multiplying. They're taking over your spa! HELP, what do we now? (Zooming back to Normal View) Hey... where's all the bugs, the water still looks clear and smells fine. Just wait... In about 12-24 hours that water is going to start clouding and might even develop a not so pleasant aroma if you don't sanitize the water and balance the chemistry. The bugs (bacteria) are having a party in your tub and you are invited to join them. Yeah, right... You're going to be life of their party. No way! This is YOUR hot tub and no one invited them. So what do you do? Now that we set the stage for you, let's look at the stuff that we never quite seem to get straight.

There are 5 basic things that need to be checked out:

- **The Water's Hardness**, also called Calcium Hardness, is a measurement in parts per million of Calcium in the water. Calcium is a metal and water needs metals to remain balanced, about 200-400ppm. If the water is low on calcium, then the water is going to have a corrosive affect on the hot tub and adversely affect the rest of the water's chemistry. Total Alkalinity and pH will be directly affected and until you get the hardness level back in range you will not win the water chemistry battle. In and around the coast and peninsula, the hardness level is very low. Tests I have performed on tap water throughout the coastal area have consistently shown levels below 40ppm.
- **Total Alkalinity (TA)** is the test that tells you (in parts per million) what the total alkalinity of the water is. The acceptable range is 80-120ppm. TA is like shock absorbers on your car. We remember "The Boat". You know the one... that big old car that belongs to your friend, boss, Uncle Fred, and it's fun to ride it because it's the ultimate cheap-thrill roller coaster. You feel every little pothole or dip with amazing longevity of the bouncing rock and roll from the bad shocks and springs on that baby. Your new car, on the other hand, drives the same section of road and you hardly feel a thing. The same is true concerning TA and your spa. If the TA is either too low or too high, then any minor change in chemistry can have a drastic affect on pH. In and around the coastal area, TA is typically as low as 30 ppm on your source water.
- **pH** (Getting really techy...This is a measure of how acidic or alkaline a substance is. The initials pH stand for "Potential of Hydrogen." Acids have pH values under 7, and alkalis have pH values over 7. If a substance has a pH value of 7, it is neutral -- neither acidic or alkaline.) Okay way too much techy stuff there! The pH around this area is typically high right out of the tap or hose but , I've seen it range from 6.8 to 8.4 in testing I've done from various areas along or near the coast. The acceptable range for us humans and our hot tubs, based on what the Pool and Spa industry gurus say, is from 7.2 to 7.8. If the water has a low pH (below 7.2), then it becomes corrosive to you and your tub and its equipment. That means it can be irritating to your skin and damaging to hot tub components as well. If the pH is too high (above 7.8) then it also is considered corrosive and can also cause discomfort and damage equipment.
- **Sanitizer Level** (Chlorine, Bromine, Alternative Sanitizers) is a test to determine what level in parts per million is being maintained to keep those bugs from partying in your tub. A bug free tub is definitely the goal. In order to accomplish this you have to maintain the necessary amount of sanitizer needed to keep bacteria from growing. Too much sanitizer on the other hand can also be a problem. Remember, you are not trying to sterilize yourself, just the water. So be sure to follow the directions provided on all bottles before adding them to your spa. Never overdose. Use the least amount possible to maintain the acceptable levels recommended for the product you are using.
- **The Filter** is the key component that often is left to fend for itself. I have heard more times than I can recall, the common phrase "Filter? What filter? My hot tub has a filter?" Some are easy to access while some are hidden away under the skirting. Some tub manufacturers have more than one filter, or even use filter systems with multiple cartridges. Regardless of the type or number of filters or their location, each and every one must be cleaned regularly and thoroughly. Neglecting your filter(s) will have an adverse affect on the water condition. Reduced water circulation, poor or no jet action, poor heater performance are all a direct result of a dirty clogged filter.

Let this all brew in your mind while we step back and look at your hot tub a moment. Ultimately the goal is simply to keep the water balanced and clean, right? So why is it so complicated? Why does your tub look like a freshly poured glass of beer with a frothy head of foam? Why does it never seem to be as easy as the hot tub store said it would? Treating the water to maintain a balance is not an art nor does it require a degree in chemical engineering, it's just a matter of understanding the order and frequency of treatment and cleaning and having an understanding of the acceptable ranges for the test results.

The following steps are based on a newly filled hot tub.

1. **Test your water using a good test kit.** This can be strips or liquid type. It should not be outdated, so replace it each year. Strips should be kept in a cool and dry place and handled carefully to prevent them from getting wet in the container. Liquid test kits should be stored in a cool, dark place. Some manufacturers recommend your frig. As with any test kit, follow the provided instructions to assure accurate readings. Be sure to take your readings in good lighting as poor lighting conditions can adversely affect the resulting reading. Remember, this is not rocket science, but it does require closely following instructions to get accurate results.

Your test kit should, at a minimum, be able to test for:

- Sanitizer (Bromine, Chlorine, Non-Chlorine Alternatives)
- pH
- Total Alkalinity
- Water Hardness (Calcium Hardness)

If your test kit is lacking any of these 4 tests, then you will not have enough information from these kits to be able to adjust or balance your water correctly. Regardless of what products a hot tub store may sell you or tell you will eliminate your water balancing issues, you must know what those issues are before you can treat them. Adding products you don't need simply complicates the balancing process. Not adding products you do need prevents you from ever balancing the water. I have seen many customer's spa supply trays and boxes filled with products they do not need and are missing products they do need. Keep it simple. Don't buy products without understanding exactly what they do and whether your water conditions will be aided by those products. For example, If your total alkalinity and calcium hardness are both low, but you only buy alkalinity increaser, then you will never get your water balanced if you ignore treatment of the calcium hardness. If you are having problems trying to figure out your water issues, many shops offer in-shop water analysis. You need to bring in a water sample, usually a quart is sufficient. The best thing to use to transport the sample is a new zip-lock bag. Don't use a jar that has been used previously for food, especially pickle jars, as these can affect your water sample adversely. Take a sample of your tap or source water. Taking a sample of your spa water is not going to give the store technician a clear picture of your water needs especially if it's a witches brew of previously added products. Knowing what you are starting out with will provide a clear picture of your specific needs.

1. **Record your test results** and refer to the following acceptable ranges. Having a record of your results can help a technician resolve any "mystery" issues that may develop.

Test	Minimum	Ideal	Maximum
Chlorine	1 ppm	2 ppm	5 ppm
Bromine	1 ppm	2 -3 ppm	6 ppm
pH	7.2	7.4 – 7.6	7.8
Total Alkalinity	60 ppm	80-120 ppm	180 ppm
Calcium Hardness	150 ppm	150-250 ppm*	1000 ppm

*Some calcium hardness (total hardness) charts will reference 200-400 ppm. While this is widely considered the acceptable range for pools and spas, 150-250 ppm is the preferred range for all residential and commercial hot tubs.

2. **Adjust your sanitizer level as needed**, based on the results of your test, to achieve the proper level based on the product you are using and its specific directions. When adding product, always follow the instructions printed on each container. DO NOT add more than the recommended dosage of any product.
3. **Adjust your water hardness next.** It should be within 150-250ppm. Wait several hours before proceeding.
4. **Retest and then adjust your total alkalinity as needed.** Do not rush this adjustment. It is better to spread out this adjustment over several hours. Use small doses to adjust slowly. Range should be between 80-120ppm.
5. Wait 24 hours before attempting to adjust the pH. This gives the water time to adjust to the 2 previous treatments. Retest before adjusting. Range should be between 7.2 – 7.8. This should also be adjusted slowly with small doses over several hours. Check it again over the next few days and adjust as needed.

If you are using non-chlorine alternative systems that use silver/copper pellet cartridges, you will not be able to detect the sanitizer level with any conventional test kit. Usually this system includes using monopersulfate as the shock. Be sure you obtain the proper test kit to test for this product. The test kit for monopersulfate does not have a specific parts-per-million range, but just a ball park low-medium-high color chart to compare to. You are using the test kit to determine if you are adding the correct amount for each treatment. You are NOT measuring for any residual as this product has no lasting residual like chlorine.

While there is a common misconception that all tubs are foamy and it's normal, this is definitely not the situation you should be in with your tub. There are basically 2 reasons your tub looks like your glass of beer. One unlikely reason might be soap in the water. The MORE LIKELY reason is the water chemistry. If your calcium hardness is low, you will have foam. That de-foamer you bought will not resolve the problem, it is simply a temporary fix until you correct your hardness issue or possibly change out the water. Get your water chemistry in balance and the foam problem will go away.

Speaking of draining... Do it. Every 3-4 months. Why? You are submersing YOUR body in it. Water, no matter how clean you might keep it, must be replenished with fresh in order to stay fresh. You've been adding chemicals, killing bacteria, adding more chemicals, adding more bacteria when you get in and that water needs a break! Be kind; replace it

with fresh water, your body will thank you. No, you won't hurt your beautiful yard with the chemicals in the water.

Since you have it empty, take time to inspect the tub thoroughly for any cracks, broken or missing parts like jet internals, screws, etc. If parts are broken and missing, then you should replace them to keep your spa working properly and safely.

If you are using those "Nature 2" silver/copper pellet cartridge sanitizers, you should be replacing them on a regular scheduled basis, usually every 4 months. Oh, those "scum" collecting spongy things? They need to be replaced or at least washed out. Dishwashers can do this (top tray) or toss it in the laundry. These are big on collecting bacteria and get pretty nasty.

We have another important consideration, how you fit your hot tub's needs into your lifestyle.

Is it a hot tub or a bath tub? Many owners neglect their tub and it begins to take on the look of a dirty bathtub. If it's a hot tub, then you need to learn how to treat it like one.

1. **Bathe or shower** before getting in to limit the introduction of organic waste.
2. **Don't wear lotions, oils or creams in the tub.** They end up in the water and in the filters and on the tub walls
3. **Establish a regular scheduled weekly and monthly visit** tub-side for inspection, cleaning and treatment.

This should include:

Water testing and analysis

Filter inspection and cleaning... Clean your filter as instructed by the manufacturer. Standard cartridge filters as well as sock filters can be cleaned with a garden hose and nozzle attachment. Filters should be cleaned at least monthly. More frequently will depend on how heavily the tub is used.

Checking jets and other water features for proper performance... Do all the jets still perform like they did when you bought the tub? Just as strong? Do waterfalls flow properly? Do those water feature valves still work smoothly and effectively?

Is there water standing around the tub that would not be attributed to yard watering or rain? Could it be a possible leak on the tub somewhere?

Know your tub's warning signs. Some have digital displays that flash lights, display codes warning you of problems that exist. Some of the older tubs do not have these indicators, so be familiar with how your tub should operate normally. Your user's guide for your tub will have specific instructions on how to correct any problems you may encounter. While many problems can be corrected by following the user's guide, some may require calling a qualified professional.

At least twice a year you should inspect your tub's equipment area for potential problems. Look for evidence of water leaks around any pump or on any visible plumbing. Catching these potential problems early can help avoid costly repairs. Use a flashlight to illuminate those dark corners. Be aware that critters like your tub equipment area as well, for its warmth and may be camped out in the dark corners and recesses. This could include wasp nests, bumblebee nests, black widow spiders, cockroaches, daddy long legged spiders, mice, wood rats and other such vermin. While they each have their place in our ecological system, your hot tub is not the best place for them, especially the rodents. If you see evidence of rodents, evict them. They are not friendly with your tub and tend to do extensive damage by chewing on wires, plumbing and insulation. This can lead to very expensive repairs.

When you operate the jets, are the pump or blower motors making noises like growling, rattling,

squeals? This indicates the need for professional service.

How's the cover? If you have a cover lift system is it working right? Is the cover getting too heavy for it? All of the standard vinyl covered foam core covers are subject to water absorption through condensation and become heavy. Once this happens, it is time to replace the cover. If the vinyl is deteriorated, but the core seems to be intact, it may be possible to recover the core, but in most cases, this is simply not practical, since the core (being Styrofoam), shrinks with age and a new spec cover would not fit properly. Most covers last about 4-7 years depending on how well they are made, the amount of protection the core has against water absorption and how protected the cover is from weather and sun. Another factor that directly affects covers is the use of ozone generators. Long exposure to ozone (O³) causes deterioration of the fabric and plastic core wrap on the underside of the cover. This also shortens the life of the cover. A floating protective blanket that lays on the water is available to help reduce this problem.

Speaking of ozone generators, if you have one, that's great! It does supplement the chemical sanitizer you use. It is NOT an effective replacement for your primary sanitizer, but can reduce the amount of chlorine required for proper sanitation. Keep in mind that if you are using chlorine as your primary sanitizer you need to have some form of oxidation occurring to eliminate dead chlorine, called chloramines. Ozone provides a practical oxidation method for removing several types of chloramines. An ozone generator's life cycle is not indefinite. It must be serviced with a new lamp (UV), Corona Discharge module or completely replaced about once a year to maintain its effectiveness. Some are very costly to repair and it's more cost effective to replace them. Typically the lamp type are more expensive to repair than the Corona Discharge (CD) type. The lamp type, due to their design, often expose internal components to high levels of oxidation that require replacing more components than just the lamp. The CD type often have a simple electrical module that is less expensive to replace and the other internal components are isolated from the module.

4. **Establish the best products suited to your personal needs** (allergies, sensitivities, etc.) and stay with those.
5. **Finally, your helpful neighbor or friend** who also has a tub is likely an expert on their tub, but definitely NOT on yours, unless of course you have convinced them to take care of it for you weekly. (Amazing what a 6-pack and an occasional tub party can get you). Each and every hot tub is as different as the individuals who regularly use it. While your neighbor or friend may have some good suggestions on how they manage theirs, be aware that their approach may or may not work well for you. Each person's body chemistry varies and the affects on the hot tub will vary as well. How you approach the regimented cleaning and treatment required to maintain your tub will also affect the results, so you have to establish a routine that works best for you and your tub.

I hope this guide has provided you the clarity needed to make your experience with your tub a more enjoyable one. If you have further questions not covered here, we invite you to contact us. We are here to support you and your tub.

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