

## What Good Water Balance Means to You & Your Spa or Hot tub

Many customers & spa owners ask, "why do I have to worry about testing & balancing my hot tub water? If it looks clear, everything must be good. Right?"

The answer is, "Oftentimes,...not."

The short answer is if the water isn't properly balanced, you're not safe, the spa and all of its components (filter, pump, heater, surfaces, fittings, even the pillows & spa cover, etc) just won't last long, and finally, you'll be wasting your money!

Wasting money? Yes. When the spa water is out of balance whatever sanitizing system you are using can't do an efficient job.

How is Water Balance affected? By almost anything that comes in contact with it. Chemicals, people, environmental debris, make up water.

Tap water? We are seeing many instances of poorly balanced water from across the country. Tap water is also introducing in fair amounts of dissolved metals that can lead to staining of the spa surface, not to mention chloramines & even mold!

So, you say, "I just have to worry about the pH in the spa, right?" No. You also need to be concerned about Total Alkalinity & Calcium Hardness.

Let's learn why.

## Tips to Maintaining Proper Water Balance:

1. **Test** your spa water at least 2 times each week. More often in times heavy partying and frequent fresh water top-offs.
2. Have your **water professionally tested** at least 1 time per refill: usually about 1/2 way between refills.
3. **Use proper spa chemicals** not household products or pool chemicals. All spa chemicals are specifically made to treat your spa or hot tub. Gradually make adjustments to pH. Would you bake foods or do laundry with pool chemicals?
4. **Use fresh testing reagents** or strips.

## Pool Water Balance Parameters:

**pH:** all spas - 7.4 - 7.6

**Total Alkalinity:** acrylic - 80 - 140 ppm  
gunite - 80 - 100 ppm

**Hardness:** acrylic - 175 - 250 ppm  
gunite - 225 - 300 ppm

# The Importance of Proper Spa Water Balance.

**pH, Total Alkalinity & Calcium Hardness**

**Important information for all Spa & Hot Tub owners who want comfortable water, efficient chemical use and long life of the spa & its equipment.**



WWW.PARPOOLS.COM  
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Stratford, CT 06615

Phone: 203.377.0100

Email: [techhelp@parpools.com](mailto:techhelp@parpools.com)

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**pH (the power of Hydrogen)** - is the fundamental water balancing measure you need to monitor & control.

Simply put, pH is the measure of how basic (high pH) or how acidic (low pH). It is measured on a scale from 0 (battery acid) to 14 (drain cleaner).

pH = 0	Battery acid, strong hydrofluoric acid
pH = 1	Hydrochloric acid secreted by stomach lining
pH = 2	Lemon juice, gastric acid, vinegar
pH = 3	Grapefruit, orange juice, soda
pH = 4	Tomato juice, acid rain
pH = 5	Soft drinking water, black coffee
pH = 6	Urine, saliva
pH = 7	"Pure" water
pH = 8	Seawater
pH = 9	Baking soda
pH = 10	Great Salt Lake, milk of magnesia
pH = 11	Ammonia solution
pH = 12	Soapy water
pH = 13	Bleach, oven cleaner
pH = 14	Liquid drain cleaner

surfaces can etch or become gritty), heaters, filters, pumps, ladders & handrails, (stainless steel can rot out in a matter of a couple of weeks), A good example of corrosion is shown to the left with the copper piping.



**Low pH** will also lead to green hair (dissolved copper in the water plates out on bathers' hair, especially blondes, causing it to turn green) and in the worst cases, even tooth decay!

When the **pH is low** you will notice: higher sanitizer use, very clear water, a "slick" feel to the water, burning of the eyes, skin and mucous membranes.

**High pH** will lead to slow sanitizer efficiency (sanitizers can't kill & control bacteria as designed), cloudy water, scaling of spa surfaces (tile, acrylic), scaling of equipment (in filters, scaling will result in shorter filter runs - see the picture below right) including filters, pumps, o rings, heaters (scale build-up of just the thickness of a regular sheet of paper will decrease heater efficiency by a minimum of 10%, and increasing the cost to heat your hot tub).

When the **pH is high** you will also notice: cloudy water, a "heavy" feel to the water, burning of the eyes (also has a pH of 7.4 like blood), skin and mucous membranes.

**What affects pH? Everything!** Whether it's the chemicals you use, the top-off water, or even YOU, the pH is affected. In a spa or tub, the average person sweats out up to 2 pints of body fluids! And there's the air bubbler. The addition of air bubbles releases carbon dioxide which forces the pH up. Hint: always test pH after the spa has been shut down for minimum of 2 hours.

**Total Alkalinity (TA)** - similar to pH but not the same. TA actually works as a buffer or a control for pH.

The affects are the same as pH, but taking longer (weeks rather than days) in its effects. TA as a buffering agent, helps keep the pH balanced. In other words, if the TA is Low, the pH "bounces" easily from low to high; add pH increaser on Monday & find that it is low again on Wednesday. TA values under 3.0, can cause the water to harmful to humans (especially younger children with sensitive skin), as the pH drops, skin lesions can occur around waist bands & tops. If the TA is High, the pH will be difficult to lower; lower it on Friday, do it again on Sunday.

When adjusting Total Alkalinity, be sure to do it at every refill. "One Time" buffers such as SpaGuard Spa Sentry work very well.

**Calcium Hardness (CH)** - the "stranger" to water balanced. Your spa, like your body, needs calcium. Osteoporosis occurs when the body lacks calcium & takes it from your bones.

In the spa, low CH leads to gritty acrylic & rough surfaces on gunite or concrete spas. These problems take place over a longer period of time (months).



High CH leads to scaling. Scaling means rough spa surfaces, heater problems & inefficiency. Cartridge filters can become "clogged" as the excess calcium permanently bonds to the cartridge.

**NOTE:** If using SpaGuard Spa Sentry, DO NOT balance CH. Spa Sentry utilizes a different buffering system.

Other affects of unbalanced pH: low pH leads to corrosion of pool surfaces (acrylic or fiberglass