



Understanding Spa Water Chemistry

Sanitizers (Chlorine & Bromine)

Bacteria and viruses like to grow in any kind of water – especially hot water. Sanitizers, like chlorine and bromine, are used to disinfect your tub water and keep it smelling fresh. These are tested using a test kit or test strips. Proper reading for chlorine is 1.5 – 3.0 PPM and 3.0 – 5.0 PPM for bromine.

Spa Shock

These are non-chlorine shock treatments that eliminate odors and reduce irritating contaminants for fresh, clear water. High temperatures and heavy bather loads mean that spas require higher sanitizer levels, as well as heavier oxidizer doses, to eliminate bather waste and maintain clear, sparkling water.

pH

This is often considered the most important component of water balance. It measures how acidic or basic your water is. If it is not kept in check you run the risk of damaging your equipment; i.e. heating elements, pump seals, and the internal works on gas fired heaters. The ideal pH range for spas is 7.2 – 7.8. Listed are the most common problems associated with both high and low pH levels:

High pH Readings	Low pH Readings
- Poor Sanitizer Efficiency – Cloudy Water	- Poor Sanitizer Efficiency
- Scale Formation	- Corroded Metals/Equipment
- Shorter Filter Runs	- Skin and Eye Irritation
- Skin and Eye Irritation	- Etched or Stained Plaster
	- Destruction of Total Alkalinity



IMPORTANT NOTE: Before adding any chemicals to adjust your pH levels, the total alkalinity must be balanced first!

Total Alkalinity

Total alkalinity (TA) is the buffer of pH – it helps prevent pH levels from fluctuating greatly. If it is not balanced correctly, the pH will not give you a correct reading. A simple way to understand the difference between pH and total alkalinity is to think of the pH as the thermometer on your furnace’s thermostat. The thermometer measures the exact room temperature. If it’s a little cooler than you like, you turn the thermostat up. You have just displayed the ability to control temperature. Total alkalinity is like the thermostat, in that it gives you the ability to control pH. *This is why you test and adjust the total alkalinity before even touching the pH test kit.*

High Total Alkalinity	Low Total Alkalinity
- Hard to Change pH	- Rapid Changes in pH
- Scale Formation	- Corroded Metals/Equipment
- Cloudy Water	- Skin and Eye Irritation
- Skin and Eye Irritation	
- Poor Sanitizer Efficiency	

Calcium Hardness

Sometimes referred to as “total hardness”, calcium hardness is a measurement of minerals in your water including calcium and magnesium. You do want your water to have some level of hardness. If the water does not have enough calcium, the water will draw from other minerals, including copper, aluminum and iron; (e.g., heating elements, pump seals, and internal parts on gas fired heaters). This will result in equipment corrosion. If there is too much hardness, you will see scale formation on the spa’s interior and the water will take on a cloudy appearance. Because of this, it is recommended that you fill your spa with water from a softener instead of tap water.



So what should the calcium reading be? Between 100 – 250 PPM for acrylic finish, and 250 – 450 PPM for plaster finish, let's look at some potential problems if it goes unchecked.

Hardness too Low	Hardness too High
- Deterioration of Metal Components	- Scale Formation On Surfaces
- Unwanted foam	- Cloudy Water

If your water is high calcium there is no known way to lower it using chemicals. Using Spa Defender gives the best preventative maintenance against scale formation. Also, if your water is high in calcium this is where you may want to use water that is treated by a softener to fill your spa. In many cases you will find low calcium reading that can be adjusted by using Calcium Booster. To make any adjustments to calcium hardness you will need a test kit or test strips.