

## A Quick Guide to Understanding Spa Pool Water Chemistry



At Arcadia, we believe that spa pools should be designed by people who are passionate about the spa ownership experience. People who use spas daily in their own homes and understand what design features provide the most important benefits for spa owners.

Our design team have been spa owners for decades and have the experience to utilize the best of new spa manufacturing technologies to bring you the best performing, value for money, spas on the market.

### **Only available at professional spa retailers**

For many people, owning a spa for the first time can be a daunting experience. Our Arcadia spa sales specialists realize the importance of professional advice through the whole purchase and ownership process. For this reason, Arcadia spas are only sold through professional spa retailers who will assist you; from selecting the best spa for your needs, through the delivery process and then for the lifetime of your spa.

On setting up your spa your dealer will have advised you that you should shock dose the water on first fill. Your Arcadia spa is water tested at the factory and some residual water may remain in the plumbing. A shock dose super-chlorinates the water and ensures there can be no residual bacteria which may cause skin or eye irritations on first use.

Your Arcadia spa is designed to help you relax and replenish your body and mind and having crystal clear water and clean surfaces in your spa are central to achieving that. Once you've used it a couple times you'll find it is all those things and more. As a matter of fact, you'll be looking forward to your next time-out at the end of each day.

But then just as you want to get away from the world and lift the cover to get in you may find that it is no longer the sparkling clear water you are used to, but a cloudy and smelly mess?

What has happened to the water? The pump is working and the filters were recently cleaned, the water is at the right temperature and except for the way it looks and smells, everything seems to be OK. You check the owners manual and notice it recommends that you test your water weekly. You see words and numbers like PPM (parts per million), sanitizers, total alkalinity, pH, and something about the possibility of the water being hard. Although this is a common scenario, water chemistry doesn't have to be scary or difficult to understand.

The first thing that you need know is that your spa is not a swimming pool when it comes to keeping the water clean. Spa water - its treatment and parameters - is much different than a swimming pool. The main difference is the temperature - spa water is most often set between 36.5 - 38.5 degrees Celsius, while a swimming pool stands typically at 20 - 24 degrees and this means that there's far more opportunity for bacteria growth in a spa. You can refer to our Arcadia Spas Quick Chemical Guide (on our website) to get your pool water clean and clear. Here you will find a more detailed explanation of spa water chemistry.

Make sure you have the 4 dot test strips that check total sanitizer, alkalinity, pH and hardness. Make sure you follow the test strip instructions and make your colour code readings immediately. As the test strips dry the colours alter and this can change your reading.

## Sanitizers

Things such as bacteria and viruses like to grow in any kind of water especially hot water. Sanitizers are used to effectively disinfect and keep water smelling fresh. The most popular ones are chlorine based. You can test these by using a test kit or test strips. Proper reading for chlorine is 1.5 - 3.0 PPM.

There are Non Chlorine based sanitizers too, Simple Silver is a widely used alternative. If you are using Simple Silver you'll need to follow the manufacturers instructions and allow the 7 day decontamination period to be completed prior to use. This enables the sanitizer to become fully active in the spa pool water. Maintaining clarity and clean water with Simple Silver also requires regular cleaning of the filters and adjusting the hours of filtration in your spa to suit the bather load (frequency of use by the number of users). A minimum of 10 hours per day on a standard set up and 16 hours per day if there is a heat-pump installed are common starting points.

## Spa Shock Treatments

These are non-chlorine shock treatments that eliminate odours and reduce irritating contaminants for fresh, clear water. Remember because of the high temperatures and heavy bather loads, spas require higher sanitizer levels, as well as heavier oxidizer doses to eliminate bather waste and maintain clear, sparkling water. Shock treatments are an excellent way to adjust for increases in bather load when using Simple Silver, without having to adjust the filtration settings. Arcadia spas also have the very useful sanitizer function of the pool controller which will help in those instances.

## Total Alkalinity

If you thought pH was important, you were right. But you can't manage accurate pH levels until you've set your total alkalinity, which makes total alkalinity even more important.

The total alkalinity is the buffer of pH, if total Alkalinity is not balanced correctly, the pH will not give you a correct reading. Setting total alkalinity gives you the ability to control pH.

Here is a simple way to understand the difference between pH and total alkalinity:

Think of the pH as the thermometer on a heaters temperature control switch. The thermometer measures the room temperature and that measurement tells you if you need to turn the temperature control switch up or down. Total alkalinity is like the thermostat, in that once you've measured the total alkalinity it gives you the ability to set the correct pH. This is why you test and adjust the total alkalinity before even touching your pH increase or decrease chemicals.

The goal is to keep total alkalinity readings inside the acceptable range of 80 to 120 PPM. If you suspect your pH level to be a little high, (from your first multi test strip reading) then try for a higher reading of 150 PPM when adjusting and re-testing the total alkalinity.

Why? Because pH-lowering chemicals will lower the total alkalinity as well. If your total alkalinity reading is below 80 PPM, then you will use alkalinity increaser. If you got a reading above 120 PPM, then alkalinity decreaser is what you will use. To achieve these readings you will need a the minimum of 4 dot test strips.

What would happen if you didn't keep the total alkalinity balanced? Let's take a quick look at the problems that can result.

### **High Total Alkalinity**

Hard to Change pH  
Scale Formation  
Cloudy Water  
Skin and Eye Irritation  
Poor Sanitizer Efficiency

### **Low Total Alkalinity**

Rapid Changes In pH  
Corroded Metals/Equipment  
Skin and Eye Irritation

## pH

This is an 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 formation of scale on the spa filter-gate, diverters and also around the spa waterline wher evaporation occurs. Listed are the most common problems associated with both high or low pH levels:

### **High pH Readings**

Poor Sanitizer Efficiency  
Cloudy Water  
Scale Formation  
Shorter Filter Runs  
Skin and Eye Irritations

### **Low pH Readings**

Poor Sanitizer Efficiency  
Corroded Metals/Equipment  
Skin and Eye Irritation  
Etched or Stained Plaster  
Destruction of Total Alkalinity

The ideal pH range for spas is 7.2 to 7.8. Any reading below 7.2 means your water is acidic. To correct this you would add PH Increaser. If the pH reading is above 7.8, it means the water is basic or alkaline. To bring the pH level down you would use PH Decreaser. Once again to achieve these readings, you will need a test kit or test strips. It is also best to get your sanitizer level at a reasonable measure before testing the PH.

**IMPORTANT NOTE:** Before adding any chemicals to adjust your PH levels, the total alkalinity must be balanced first.

## **Water Hardness**

Sometimes referred to as "total hardness" or "calcium hardness" water 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). 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.

So what should the calcium reading be? Between 100- 250 PPM's for acrylic finish. Let's look at some potential problems if it goes unchecked.

### **Hardness too Low**

Deterioration of Metal Components in Spa Equipment  
Unwanted foam

### **Hardness too High**

Scale Formation On Surfaces  
Cloudy water

If your water is high in calcium hardness you will need to add softener and re-test. If you can't manage to reduce the water hardness using chemicals you may need to find an alternative source for your water. Bore water can be especially problematic in this regard. In many cases you will find a low calcium reading that can be adjusted by using a calcium booster. To make any adjustments to calcium hardness you will need a 4 dot test strip that includes the hardness test.

There are other chemicals available that will help keep your water clean, clear and free from oily scum. These can be found at your local dealers selection in-store.

Remember to test your water regularly, at least every time you top up the water level or add more sanitizer (which introduces more calcium to your water) but most of all, enjoy your spa!