

## Understanding Water Chemistry

### Chlorine:

Properly setting the output level of your salt chlorine generator is critical for maintaining appropriate chlorine levels in your pool. Ideally, the output should be adjusted by the chlorine demand. Chlorine demand is defined by the amount of free chlorine consumed by contaminants in water. Contaminants may be inorganic – such as rain, fertilizers, or air pollutants - and/or organic material – like bather waste, dust, dirt, pollen, bugs - in nature. Source water will also influence the chlorine demand of your pool. Output from the generator must compensate for all these sources. Output is itself influenced by generator/pump run-time, size of cell, condition of cell, and water attributes. It is important to test chlorine and ph levels after exposure to contaminants noted above and rebalance if necessary.

Depending on the output level of your salt chlorine generator and the actual chlorine demand, the levels of the different chemicals in your pool will vary. If the chlorine demand is higher than the chlorine output, the free chlorine level will be too low to prevent the growth of algae or other microorganisms. If your chlorine demand is lower than your chlorine output, you will increase the free chlorine level over time which could harm the liner and cause bather discomfort. Sunlight has a high impact on the amount of free available chlorine (FAC) in the water: strong sunlight rapidly diminishes the amount of chlorine in a pool. A stabilizer must be added to maintain chlorine levels.

***Free available chlorine** is the part of the total chlorine measurement that has not yet reacted with contaminants.*

There can be a number of ways to introduce chlorine to your pool: Shock, Saltwater Chlorinators, granulars and pucks are but a few. But No matter the chlorine source, localized accumulation of chlorine should be avoided. This describes a situation where the amount of chlorine is higher in one part of the pool than in another. Common accumulation areas are on the pool floor and in the deep end corners of the pool. Accumulation in these areas can create much higher chlorine levels than what is measured in the rest of the pool. It is important to have good water circulation and conduct regular brushing to avoid “dead spots” where chlorine has settled on the pool bottom.

Random section of a pool








Settled chlorine > "Micro pool" with different pH and chlorine level



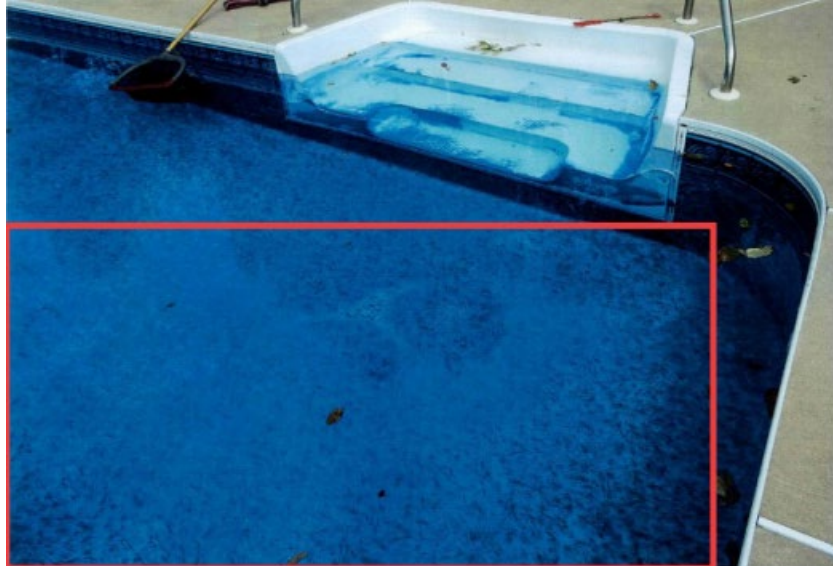
### Salt quality and stains:

Pool liner stains are unappealing and can ruin the perfect appearance of a pool. Pool owners will almost certainly notice stains when they appear and will raise the issue with their pool maintenance person or pool installer. In many cases, the pool owner believes that there is a quality issue with the vinyl liner, but typically these issues are related to contamination of the pool water/liner, or improperly maintained water chemistry. There are two main sources of stains. Organic stains can be caused by materials such as debris from plants, insects etc, and inorganic stains caused by metals such as iron, calcium, barium, manganese and copper. Metals can enter the water from several sources, including fill water, water chemistry products, and water pumping and cleaning equipment.

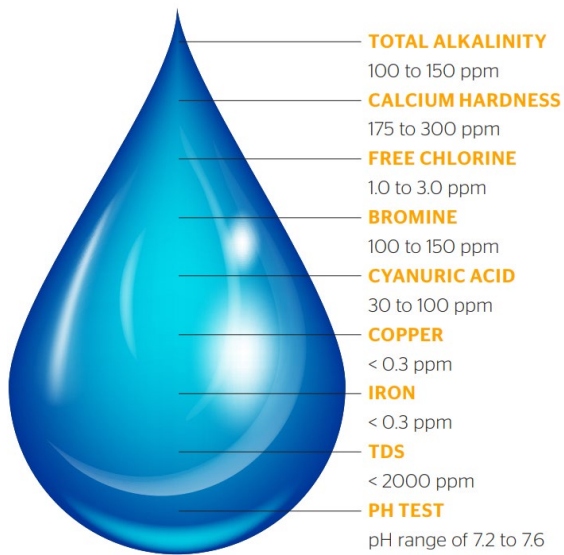
**Identify Your Pool Stain**

				
<b>Green &amp; Brown</b> (Organic)	<b>Red &amp; Blue</b> (Organic)	<b>Blue/Green</b> (Metal)	<b>Red/Brown</b> (Metal)	<b>Purple/Black</b> (Metal)
Leaves, dirt, bugs, algae, worms	Wild berries and tree fruits	Caused by copper in source water or algaeicide	Caused by iron	Caused by manganese

For saltwater pools, owners must be aware of a critical, additional contamination source – the salt itself. Depending on the salt quality, the same stain-forming inorganic impurities listed above may enter the pool from the saltwater generator. Balanced water that is not over-saturated with minerals or metals will remain clear, and the liner will be free of many solid deposits. Using a salt chlorine generator can contribute to higher pH-levels. A pH level greater than 8 units can cause metals to "unmix" with the water and deposit a stain on the liner.



*Tip: A sequestering/chelating agent can help to keep metals from separating/precipitating out of the water.*



Both salt and traditional chlorine pools require consistent maintenance. It is critical to regularly check water chemistry, ensuring that the proper parameters are maintained:

\*May be different depending on state or local regulatory requirements.

