

Pool water chemistry and stain removal

Pool water chemistry has always been a sticking point for new pool owners. Water chemistry involves terms and requirements that most of us have never dealt with, like p.h., total alkalinity, and titration tests?!? Although the following is far from text book description and would probably make a water chemist cringe, it may help in understanding how all this fits together. Let's start out with the facts.

- *P.H. means potential hydrogen or the relative acidic or base condition of water, and can be tested with a test kit or test strip that you dip in the water. A tear drop has a P.H. of 7.0.*
- *T.A. or total alkalinity is the material in water that buffers P.H., and helps keep it stable. This can also be tested with a test kit or test strip.*
- *Calcium hardness or basically water hardness. A test kit must be used to check this.*

Imagine that water has a personality with likes and dislikes. For water to be happy, it must be content or in other words be balanced. If water's P.H. is too low, it's hungry and wants to eat. If it is very hungry, it will eat metal from your pool heater or pigment from the gel coat. If water's P.H. is too high, it will feel full and begin to get rid of what's in it. Deposits will form on pool surfaces causing visible scale and or metal deposits. If water's total alkalinity level is not right, water will be unhappy and start bouncing its P.H. up and down (sort of a tantrum). If water is too hard it will want to get softer by getting rid of the things that make it hard and water may become cloudy. When water is balanced, or content, it is clear and blue, and it feels good on your skin, sanitizers work better, and all is well with water. I hope this story of waters personality helps to give you a better understand about water chemistry.

So now that we know that water is happy when it's balanced. What is balanced water for a fiberglass pool and how do we get it there?

P.H. ~ 7.4

T.A. ~ 80 ppm. (Parts per million)

Calcium hardness ~ 350 ppm.

These three items that make up water chemistry can be thought of as a tripod. If one leg of the tripod is off the whole thing falls over. Water that is out of balance can lead to rapid algae growth, cloudiness, bad color, and lack of sparkle. To give you an idea of the importance of balanced water, consider this. Water with a PH. of 7.6 ppm. will require twice as much chlorine to be as effective as water with a PH. Of 7.2 ppm. You can use a test kit or test strips to find these water chemistry values, or you can take a sample of your pool water to a local pool store and have them test it for you. Your pool store can tell you what chemicals you will require to balance your pool water or a good test kit will have a booklet with that information if you want to do it yourself.

The next topic is sanitizers. Sanitizers keep the water free of bacteria. Chlorine and bromine also kill algae spores. There are other types of sanitizers that are very effective, but for simplicity sake, let's focus on chlorine. In order for chlorine to do its job, it must remain in the water all the time in the range of 1 to 2 ppm. If the chlorine level drops too low, algae will begin to grow and bacteria can flourish. If chlorine is above 3 ppm. it will burn your eyes and may cause damage to pool accessories and equipment. Each time that the chlorine level drops too low, algae spores multiply. It takes more and more chlorine to get the algae under control. This will result in excessive "shocking" to control the problem. The term "shock" means raising the chlorine level to 10 ppm. or higher to kill the algae and bacteria. If your filtering system only runs for five hours a day, then that's nineteen hours a day that chlorine is not being added to or circulating in the water. It is best to filter and circulate the water in cycles such as two hours on, four hours off with a minimum of eight hours of filter time in a twenty four hour cycle. This results in a more constant and even distribution of chlorine. Chlorine must constantly be added to the water because some of it evaporates into the air and the rest spends itself killing bacteria and algae spores.

Chlorine can be added to water several ways. Chlorine feeders are connected to the pools plumbing. Chlorine is added to the feeder and as water passes through, small amounts of chlorine mix with the water as it returns to the pool. Chlorine generators use an electrode connected to the pools plumbing to generate chlorine electronically by converting salt, which has been added to the pool water, into chlorine. Chlorine can also be added to water by hand, however this would be the least effective method. In order to reduce the loss of chlorine through evaporation, a material called cyanuric acid can be added to water. This product, known as stabilizer or conditioner, acts like a chemical blanket and keeps chlorine in the water. In order for cyanuric acid

to be effective, it must be maintained at 40 to 80 ppm. If there is too much, it complicates water chemistry. If there is too little, it does not work at all.

*There is one other thing to consider about water chemistry, and that is total dissolved solids also known as TDS. TDS are all the materials in water that are invisible because they are totally dissolved. When TDS gets too high, around 1,500 ppm, water may become cloudy and more abrasive. High TDS. Will also effect the performance of chlorine and may give misleading water chemistry tests. If TDS. gets too high, water will have to be drained (**never drain a pool without the advice of a pool professional as serious damage may occur**) and fresh water added. TDS levels change very slowly so about once a year, take a water sample to your local pool store to be tested.*

Fiberglass pool stains

If you encounter a discoloration on your pool walls or floor that will not brush off or rub off, not all is lost. Fiberglass draws metal to its surface like a magnet and it literally plates the gel coat surface. The only way to remove it is through chemical treatment. There is no need to drain the pool. Chemicals can be added to the pool water that will remove the stains. The longer the stain is on the pool, the harder it will be to get it off, so don't wait to solve the problem.

The major contributor of staining is iron that usually comes from well water or city water that runs through iron piping. Copper and other metals that are dissolved in water will also plate the pools gel coat. Ascorbic acid, citric acid, and several brand name chemicals may also remove metals. The biggest problem with these chemicals are that, although they remove the metal from the pools surface, the metal goes back into the water where it can then re stain the pool.

Chemicals called sequesterine agents are often mistakenly used to remove metal with very poor results. Sequeaterine agents help keep metals dissolved in water so that they will not precipitate (drop out) and stain the pool. The problem with this approach is that when pool water is shocked with chlorine, the bond that holds the metal is broken and the metals still stain the pool.

My favorite metal remover is Metal Magic from Proteam Products. It is one of the few products that I know of that takes the metals off and they won't come back. It is available in many locations. If you can't find it at your local pool store, there web site is www.proteampoolcare.com. Follow the directions furnished with the product for best results.

If pool staining is still a problem, maybe we can help



In this picture, the pool was being drained for purposes other than stain removal, but it shows how effective Metal Magic is. It works even the pool is full of water.