

1. Adding Chemicals to your water: Chemicals should be added slowly over a period of time. Pool owner/operators need to remember that all chemicals added will have an effect beyond their intended purpose. Whether you use the Pool Professor Software or not you need to add chemicals one at a time and normally half the recommended dosage to see if this brings the water into the proper parameters. Retest your water about 2 hours after adding a chemical to see if the other half needs to be added and what other test results may have been affected. It is always easier to add more chemicals to your pool water than it is to take them out if you add too much. You should add chemicals in the following sequence:

- a. Free Chlorine – remember this will affect your pH in some way
- b. Alkalinity – make your life easier and get the alkalinity between 80 and 120 PPM.
- c. pH – from 7.2 and 7.8 so that the other chemicals work properly
- d. Cyanuric acid – understand that this is already contained in Trichlor and Dichlor chlorine products. High levels above 100 PPM may lead to cloudy water and algae growth.
- e. Hardness – 200 to 400 PPM to keep the grout between tiles and the walls of your pool intact. Vinyl liner pools do not need the calcium, but the calcium hardness level is still a part of properly balanced water.

If your chlorine is in proper adjustment then move to alkalinity, and so forth down the list. Wait and retest after each chemical addition to the pool.

Note: At the beginning of the season adjust alkalinity first.

2. Volume of water: Know the number of gallons in your pool as accurately as possible (5% +/-). You need to know the number of gallons to determine how much of what chemical to add to your water. Usually the hardest measurement to determine is your average depth. A pool that was having some problems because the operator was told that the pool was 82 feet by 75 feet with an average depth of 6 feet and had 276,000 gallons. Nothing the pool operator was doing chemically was making sense. Finally, we re-measured the pool by taking one rectangle and making it into four rectangles and had a more precise average depth of 7 feet. This pool had 322,000 gallons not 276,000, a BIG difference.

3. Understanding the chemicals: Know the chemicals you are using in your pool and why. Read the label of ingredients to know what you really are buying. Understand the effect that these chemicals will have on other parameters (pH, alkalinity and cyanuric acid primarily) in the water. I use Trichlor sticks, with an erosion feeder, and calcium hypochlorite as the chlorines for my pool.

The reasons are as follows:

- a. Trichlor lowers the pH and calcium hypochlorite raises the pH.
- b. Trichlor has stabilizer built-in and calcium hypochlorite does not.
- c. Trichlor adds chlorine slowly through an erosion feeder and calcium hypo. can be added quickly. (Note: Thoroughly mix the calcium hypo into a 5-gallon bucket of water and let it settle before adding to the pool. The liquid mixture is poured around the pool perimeter; the white residual is not poured into the pool or skimmer.) Note: Make sure all calcium hypochlorite granules are dissolved before pouring in a vinyl liner pool. More about this in hint Number 4.
- d. Both Trichlor and calcium hypochlorite have a long shelve-life

4. Using chemicals properly: The Pool Professor thoroughly mixes the calcium hypo into a five-gallon bucket of water and lets it settle before adding to the pool. I always put the lid on the bucket and let it settle for at least 2 hours before using. Normally I add the mixture at the end of the day so I can start the next morning with a 3 to 5 PPM reading of free chlorine. This technique of using both Trichlor and calcium hypochlorite on a daily basis has reduced my need for soda ash to increase my pH and reduced the amount of cyanuric acid entering my pool by using less Trichlor. Remember – do not mix any chemicals directly together unless instructed to do so. The Trichlor tablets are placed in an erosion feeder and then the chlorine is injected into the return line, this is the correct way to introduce the chlorine into the water. Note: Make sure to use the chemical recommended by the manufacturer in this type of feeder. Trichlor sticks, pucks, tablets have a pH of 2.8 which is very acidic, I do not believe in putting most chemicals in the skimmers because of the corrosive affects on metal parts of the filter and heating systems. The calcium hypochlorite solution is poured around the pool because it has a pH of 11.8 and would cause a scaling effect on metal parts of the filter and heating systems. **DO NOT POUR** the white material into the pool or the skimmer – dispose of it in accordance with manufacturers’ recommendations. Note: Make sure all calcium hypochlorite granules are dissolved before pouring into a vinyl liner pool.

5. Water Make up: Perform a complete water test on the water you use to fill the pool so that you know what to expect when adding water. The water you fill your pool with may have a high or low pH, alkalinity, and/or hardness level. I have seen city water supplies with a free chlorine reading of 1.0 PPM, pH of 7.5, and an alkalinity and hardness of 100 PPM. I have also seen some water supplies with a chlorine reading of 0 PPM and pH 8.4, alkalinity and hardness of 20 PPM. Each water supply and pool will be different.

6. Record Keeping: Good record keeping is necessary to function at a high level of efficiency! The more information you track on your pool the more of an understanding you will have in taking care of it.

7. Safety Information: Have available safety information regarding chemicals, machinery, and other features of the facility. Use and store all chemicals correctly. Be sure a wear protective eye protection, gloves, and other clothing when working with the chemicals. The less you know about the chemicals used the more dangerous they can be to you.

8. Proper Pool Water Balance: Keep the water balanced using either the Saturation Index or the Ryznar Index method. These two indexes will not agree. When the water is balanced using the Saturation Index it will not be in balance with the Ryznar Index. I have used both and have liked both. I personally feel that so long as you balance the pool water using either index the equipment and individuals using the pool will be better off. Remember this has nothing to do with chlorine or bromine, but everything to do with pH, total alkalinity, water hardness and the water temperature.

9. Stabilizer: Try to maintain the cyanuric acid/stabilizer between 10 PPM and at the most 50 PPM. Remember that Trichlor and DiChlor chlorine add Cyanuric Acid when you add these products to your water.

10. Cleaning: Have a regular cleaning program of brushing and vacuuming of the pool. Once a week you brush all of the pool that you can, including the walls, bottom, and inside of the skimmers and gutters. Try to do this at the end of the day and then let everything settle to the bottom overnight. The next morning, before anyone gets in, vacuum the pool thoroughly.

11. Maintenance: Keep up with preventative maintenance and making sure equipment is sized correctly. Check to see that filter media is changed per manufacturer's instructions. Sand in a sand filter should not go bad and have to be replaced on a regular basis. Sand can become contaminated if chemicals are added to the water incorrectly and/or bathers that are using suntan lotion are not taking showers before entering the pool. I have two filters that have had the same sand for over twenty years and are doing an excellent job of filtration.

12. Test kits: Purchase a new complete test kit once a year, or replace reagents, liquid every 3 months and tablets every year. Follow the manufacturer's instructions, and repeat any test that does not make sense to see if it correct. Testing of disinfectant (chlorine) and pH levels at least every two hours and in a spa every hour during heavy bather loads is important to maintain a safer pool environment. I am not yet a fan of test strips, even if I had test strips I would still have a standard test kit on a regular basis to confirm readings. A standard test kit will test free and total chlorine, pH, alkalinity, hardness, and if needed cyanuric acid. I have had a number of people who have told me that they are using test strips and gotten a free chlorine test reading greater than their total chlorine reading – that is mathematically impossible.

13. Recommendations:

- a. It is recommended that you do not adjust the water's alkalinity and hardness within 24 hours of each other. If sodium bicarbonate is used to adjust the total alkalinity you should wait at least 24 hours before adding calcium chloride for increasing water hardness.
- b. Do not increase the Total Alkalinity by more than 50 PPM in a twenty-four hour period time.
- c. Do not lower the Total Alkalinity more than 10 PPM per day.
- d. Do not raise Calcium Hardness more 50 PPM every 8 hours.
- e. Do not lower or raise the pH by more than .4 units on the pH scale at a time. Being that the pH scale is logarithmic this would mean you are attempting to make your water 4 times more acidic or basic than it is presently. Be patient and move it gradually – make sure the alkalinity is in the proper range before moving your pH.

14. What chemicals does the Pool Professor use?

For the large indoor public pool he runs:

1. Chlorine – Salt Chlorine Generator
2. Alkalinity - Sodium Bicarbonate – added if needed which may be every 6 months because of the Carbon Dioxide.
3. pH - Carbon Dioxide
4. Hardness - Calcium Chloride – added on average ever 6 to 8 months

For my wonderful wife's backyard pool:

1. Chlorines - Salt Chlorine Generator
2. Alkalinity – Sodium Bicarbonate
3. pH – Normally my Sodium Bicarbonate takes care of any pH adjustment because of my balancing act with the chlorines.
4. Hardness – The calcium hypochlorite also helps in this matter.
5. I use a Super Concentrated algaecide on a regular maintenance routine.

