

## Basic Understanding of Cyanuric Acid

Cyanuric Acid, also known as CYA, Stabilizer or Conditioner, is important to have in the pool in the right balance with your Free Chlorine. But high CYA levels can lead to problems if you don't keep your water in balance.

When you put chlorine into your pool water, it transforms into *sodium hypochlorite ions*. If you do this without CYA in the water, when ultraviolet (UV) rays from the sun hit those ions, they break apart. The chlorine part evaporates, leaving very little free chlorine in your pool water.

If you have CYA in the water, once the chlorine in your pool water has transformed into sodium hypochlorite ions, the CYA binds to those ions, preventing them from breaking apart when exposed to UV rays. This is how it preserves your free chlorine to last longer in the water so it can destroy bacteria and other contaminants.

The bad news is, CYA also slows down *the speed* at which the chlorine can kill anything in the water. This means with CYA, chlorine lasts longer...but kills slower. The higher the CYA goes, the slower the chlorine can kill anything in the water. So, if CYA is too high, algae, bacteria and other contaminants can grow faster than the chlorine can kill them.

With PoolRx, we are eliminating all algae in the pool, and preventing it from growing, even the algae you can't see that is consuming your chlorine. So in high CYA environments, with slow acting chlorine, you are now algae free AND have more available chlorine in the water to eliminate other contaminants and keep your water clear.

The World Health Organization recommends an upper limit of 100 parts per million (ppm) of cyanuric acid in a swimming pool. They arrived at this number based on the assumption that children will likely swallow some water while swimming, and if they ingest too much CYA, it can make them sick. For Commercial Pools refer to your local Health Codes, as many have lowered that limit to below 100ppm.

It's widely accepted that CYA at 20-80ppm is in normal range. The higher CYA goes above 50ppm the slower it will be to work in the water.

IN REALITY: We understand the popularity of "Stabilized" chlorine tablets, called *trichlor*, and granular chlorine shock, called *dichlor*. These are great products, that provide highly available chlorine and with tablet form that dissolve over time. But understand these products are between 50- 58% CYA. This means, if you are using them on a weekly basis, you will quickly be at 100ppm or higher of CYA.

Again this is NOT a problem when using PoolRx, but you need to be sure to keep your water in balance, especially when it comes to your Alkalinity.

As a general rule, when your CYA is at 100ppm or above, consider your Total Alkalinity 1/3 lower than what the test reads. This means you will need to adjust TA up based on this number to keep water in balance. If you don't, the CYA can fall out of solution and cause problems.

Please refer to the back of this page for further explanation and standard dosing chart.



**PoolRx works great with high cyanuric acid environments, but keep water in proper balance.**

PoolRx does its job in high CYA environments, eliminating and preventing algae, while freeing up chlorine to be more available. In fact without PoolRx, in a high CYA pool, you are going to be in trouble, because your chlorine simply can't kill fast enough to keep up with algae and bacteria growth.

To better understand CYA please refer to the previous page. It's important to know that CYA greatly affects your Total Alkalinity readings. So, if CYA is above 100 be sure to calculate your Adjusted TA and keep it within normal ranges. Alkalinity normal ranges are 80-120. CYA normal ranges are 20-80 ppm. If you allow CYA levels to reach the 125-150ppm range, or above, your Alkalinity reading will be off and the water will be out of balance. The higher CYA goes, the more important this becomes.

**For example:**

if pH = 7.4; AlkTA = 100 ppm; and CYA = 150 ppm:  
 $AlkC = AlkTA - (CYA \times CyF)$   
 $AlkC = 100 - (150 \times 0.30)$   
 $AlkC = 55 \text{ ppm}$

**Key for AlkC: Adjusted TA Calculation**

<b>pH</b>	6.5	7.0	7.2	7.4	7.8	8.0
<b>CyF</b>	.11	.22	.26	.30	.35	.36

AlkC = 'Calculated' or Adjusted Alkalinity. In this example it is too low.

You would need to add sodium bicarbonate to raise your AlkC. See standard dosing chart to raise Alk.

To simplify:

As a general rule, consider your Total Alkalinity 1/3 lower than test, when your CYA is at 100 or above.

**Raising Alkalinity Using Sodium Bicarbonate**  
**GALLONS**

ppm	1,000	5,000	10,000	15,000	20,000	25,000	50,000
10	0.14 lbs.	0.70 lbs.	1.40 lbs.	2.10 lbs.	2.80 lbs.	3.50 lbs.	7.00 lbs.
20	0.28 lbs.	1.40 lbs.	2.80 lbs.	4.20 lbs.	5.60 lbs.	7.00 lbs.	14.00 lbs.
30	0.42 lbs.	2.10 lbs.	4.20 lbs.	6.30 lbs.	8.40 lbs.	10.50 lbs.	21.00 lbs.
40	0.56 lbs.	2.80 lbs.	5.60 lbs.	8.40 lbs.	11.20 lbs.	14.00 lbs.	28.00 lbs.
50	0.70 lbs.	3.50 lbs.	7.00 lbs.	10.50 lbs.	14.00 lbs.	17.50 lbs.	35.00 lbs.
60	0.84 lbs.	4.20 lbs.	8.40 lbs.	12.60 lbs.	16.80 lbs.	21.00 lbs.	42.00 lbs.
70	0.98 lbs.	4.90 lbs.	9.80 lbs.	14.70 lbs.	19.60 lbs.	24.50 lbs.	49.00 lbs.
80	1.12 lbs.	5.60 lbs.	11.20 lbs.	16.80 lbs.	22.40 lbs.	28.00 lbs.	56.00 lbs.
90	1.26 lbs.	6.30 lbs.	12.60 lbs.	18.90 lbs.	25.20 lbs.	31.50 lbs.	63.00 lbs.
100	1.40 lbs.	7.00 lbs.	14.00 lbs.	21.00 lbs.	28.00 lbs.	35.00 lbs.	70.00 lbs.

When water is out of balance it will attempt to balance itself, and drop out of solution whatever is in excess in the water. When cyanuric precipitates out, it can combine with the copper minerals, forming coppercyanurate. This comes in the form of a purple dust. This can be brushed up, but will not leave the pool until CYA is reduced and water is back in balance. If this happens, we recommend draining or partially draining the pool. Once the cyanuric levels are within normal ranges, and the water is in balance, the purple dust will dissolve back into the water. If the cyanuric level is high, we recommend using liquid chlorine until the cyanuric level gets back into normal ranges. You can also use Cal-Hypo, but BE SURE to follow the direction and dissolve the Cal-Hypo in a bucket of water before adding to the pool. If you don't, PoolRx makes that chlorine so active and available, that the granular Cal-Hypo can oxidize when it hits the surface, and you don't want that.

When water is in normal ranges, with PoolRx you only need a chlorine minimum of 0.5 to 1.0ppm in a residential pool. This is about 1 tri-chlor tab per 10k gallons of water per week in the summer. This reduction in tabs will save you money and also help reduce your cyanuric build up. PoolRx allows for a wide margin for error in your water chemistry and balance, but everything has its limits. The only time you may run into problems with PoolRx is if your water is drastically out of balance and completely saturated. For more information, please send questions to [info@poolrx.com](mailto:info@poolrx.com).