Guide to Hot Tub Enjoyment & Savings

TechniChlor

colorChlor

Made in USA Salt Water Patent Pending

Hot Tub Sanitizer

Clean, Soft Water *Live The Fantasy!* Natural, Economical

Welcome to the world of salt water chlorine generation for spas & hot tubs. There is nothing new about this technology, just that it has been miniaturized & optimized for use in portable hot tubs. You will not find an easier to use or cost effective way to treat your hot tub. We are so confident of this statement we guarantee it.

3 Things You Can Expect When Using TechniChlor and ColorChlor

1. ***Unequalled Comfort & Enjoyment***
2. ***Simplified Hot Tub Maintenance***
3. ***Substantial Savings in Time, Money & Water***

3 questions you may ask yourself about the TechniChlor & ColorChlor

1. ***Is this too good to be true?***
2. ***Is this is just another gimmick?***
3. ***Will this harm my hot tub?***

The answer to these questions is definitely not! Keep reading and you will find out why.

ColorChlor & Technichlor aka “The Hot Tub Wizard” were designed and engineered by people that have over 15 years experience in designing & producing chemical automation systems for pools and spas and over 25 years experience in the swimming pool industry servicing, repairing & training in recreational water facilities ranging from 200 to 1.8 million gallons of water.

When chlorine generation made its mark on swimming pools and larger spas due to its ease of use, exceptional water quality and bather comfort, many requests were made for a device that was suitable for a hot tub.

Simply put, the TechniChlor & ColorChlor work continuously to keep your hot tub clean, clear and trouble free with minimal effort, utilizing natural items you can get at your local grocery store. These items are plain salt, baking soda and white vinegar. The ColorChlor makes pure, natural chlorine from a small amount of salt dissolved in the water through electrolysis, the baking soda is used for raising total alkalinity if needed and the white vinegar is used to adjust pH.

The only exception to this very basic maintenance requirement is if you have phosphates in your water. Phosphates can come from the municipal water supply and from bathing suites washed in laundry detergents that contain phosphates as not all of this will be rinsed out in the washing machine. Phosphates will increase sanitizer demand and cause foaming.

All natural phosphate removers and test strips are readily available to easily remove phosphates from your water.

Listed in this chart are the elements you will need for hot tub maintenance with ColorChlor & Technichlor.

Element	***Function***	***How Much per 100 Gallons?***
Plain Salt	Enables chlorine production	2 ½ Cups
White Vinegar	Lowers pH and/or alkalinity	3-6 oz.
Baking Soda*	Raises total alkalinity	1-3 tablespoons
Hardness Increaser*	Raises calcium level if low	1-3 tablespoons
Phosphate Remover*	Removes phosphates	.5-1 oz

*optional elements required for some areas depending on local water supply. Dosages provided are given as a reference point to get you started. Actual quantity needed could be more or less depending on specific conditions.

Chlorine Generators are devices containing electrical cells which generate chlorine from a bank of salt added to the pool water. After being depleted, the Free Available Chlorine reverts back to salt to be reused. This device is really not an 'alternative' system, as Free Available Chlorine is produced and reacts the same as adding chlorine from a purchased bucket or bottle without the effects of added by- products that come with packaged chlorine and get dissolved in the water.

Why Does My Skin Feel So Good When Using Chlorine Generation?

Pools and spas with chlorine generators make your skin feel good for several reasons.

1. The salt has a softening effect on the water.
2. The water is being sanitized on a continual basis which greatly diminishes formation of chloramines. Chloramines are what people dislike when using chlorine.
3. Only pure chlorine is being made so impurities are effectively being sanitized.

How Much Salt Does It Take?

All you need is 2.5 lbs. or 3.7 cups of salt per 100 gallons of water to continually make chlorine day in and day out. Of course, some salt will be carried out when you use your hot tub so a small amount will need to be added from time to time. Example: a 300 gallon tub will need 7.5 lbs. of salt. (2.5 X 3 = 7.5) or 11 cups of salt (3.7 X 3 = 11.1)

Traditional Chemical Treatments

A major problem with chlorine and bromine tablets is the fact that they are extremely low in pH which causes your water to become very aggressive as the pH and total alkalinity start dropping to low levels. This causes metal parts to deteriorate potential discoloration to the shell and of course eye and skin irritation. Chlorine powders and tablets sold for spa use also contain cyanuric acid and bromine tablets contain BCDMH which actually inhibit the ability of chlorine or bromine to effectively sanitize, especially as the levels increase.

What about CYA (Cyanuric Acid/Conditioner)? CYA is in chlorine granules and tablets. This can be a controversial subject but here is the reality. CYA is not recommended for spa use because it lowers the ability of the chlorine to oxidize. (ORP – Oxidation Reduction Potential) This can be witnessed in any pool or spa with an ORP controller. With a spa, the hot water will degrade the chlorine faster than sunlight and since I rarely ever see a hot tub that isn't covered, why use it. If you use CYA in a spa, it will take more chlorine to keep it marginally sanitized. Very high levels of chlorine will cause corrosion.

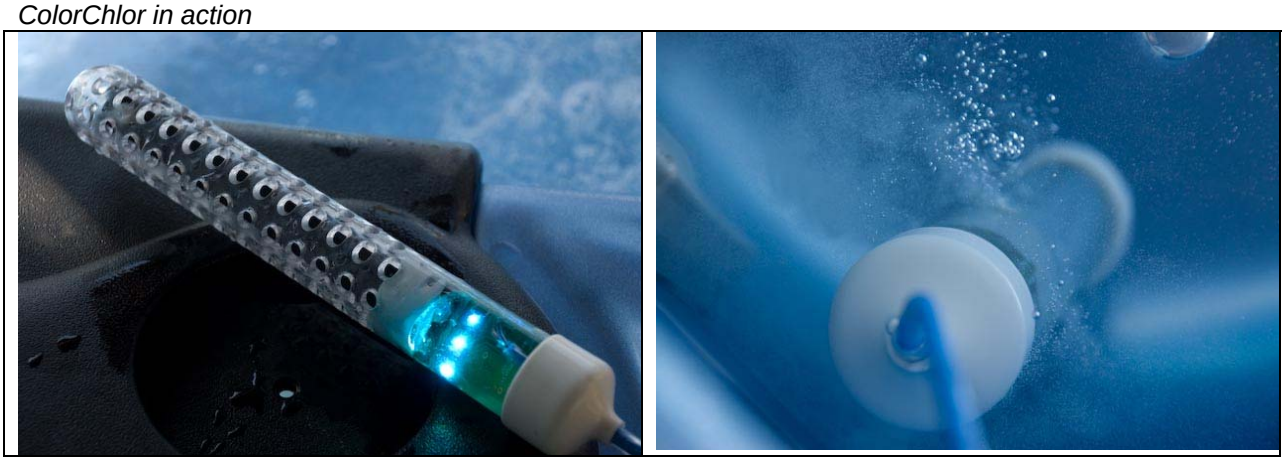
Here are some excerpts from the Pennsylvania Department of Health which is in agreement with other state agencies.

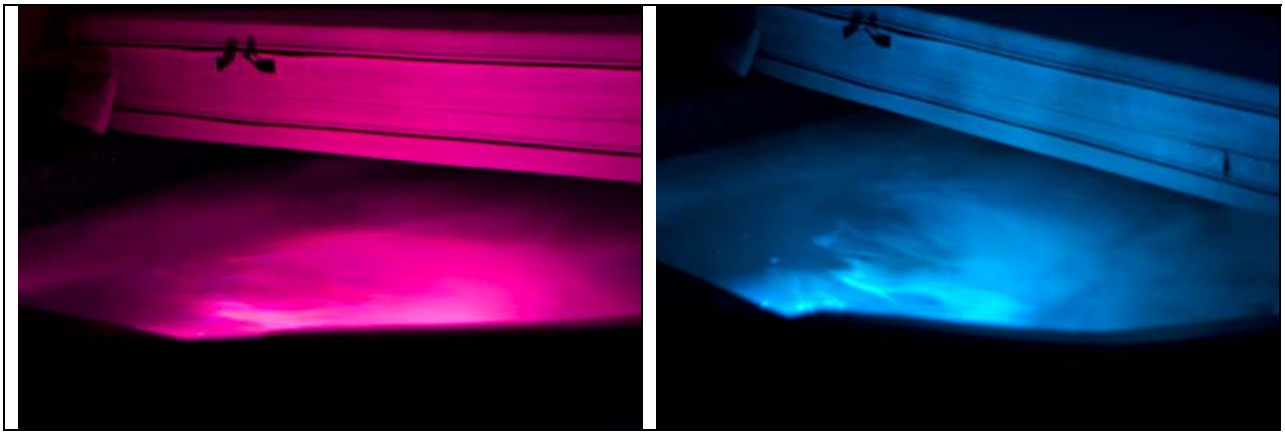
8. **What are the effects of higher levels of cyanuric acid? –** As the level of cyanuric acid rises, the "killing power" of the free chlorine residual weakens. At above 50 ppm of cyanuric acid, the time it takes to kill bacteria in the water is much longer compared to swimming pool water without cyanuric acid. As the level of cyanuric acid builds up, the chlorine will become increasingly less effective in keeping the water clean and problems such as increased cloudiness in the pool water, high bacterial test results, and even algae growth can occur.

9. **Should cyanuric acid be used in hot tubs or spas? –** At even moderate levels of cyanuric acid, the amount of time it takes chlorine to kill *pseudomonas aeruginosa* (the bacteria that causes "hot tub itch") can be as much as a hundred times as long as in a hot tub or spa without cyanuric acid. For this reason, the Pennsylvania Department of Health does not recommend the use of cyanuric acid or stabilized chlorine in any hot tubs or spas

This is why hot tubs treated with chlorine granules or tablets have to be drained on a regular basis. As the CYA buildup occurs, it becomes impossible for the chlorine to do its job. This same effect will also happen with bromine tablets as the **BCDMH** found in bromine tablets have the same effect on bromine as CYA has on chlorine. This is why when you start with fresh water the first month is generally less trouble to maintain water quality and then it goes downhill from there.

ColorChlor in action





Corrosion?

The issue of corrosion continually comes up as a mystery and it really doesn't have to be. Before chlorine generators arrived on the scene here in the US, we had regular old pools that had corrosion issues. Many of these pools & spas were treated with liquid chlorine and had high TDS levels. The reason for this is that high TDS levels increase the conductivity of the water letting stray currents to run through the water. Further investigation with sensitive instruments revealed that these bodies of water were not grounded properly. This was the cause of the corrosion. The only practical way to deal with this was to place zinc balls in the skimmers and inspect them monthly to make sure there was no scale buildup on them as this makes them ineffective and they will need to be acid washed so they will do their job, which is to help neutralize the stray currents in the water. It takes such a small amount of current that most people would never even detect its presence. This problem is much easier to deal with in a hot tub as you can make sure it is properly grounded with minimal effort.

Just about every major pool and spa equipment manufacturer has chlorine generators in their equipment line ups. In fact, chlorine generators are now being installed on 50% of all the new pools being built in the US. Most of these have gas fired heaters which creates a hot water environment in the presence of a very soft metal (copper) and there are no salt water corrosion issues with these applications. I have personally installed and maintained salt water spas in health clubs and not found corrosion to be an issue.

I know of several hot tubs that have been on chlorine generation for 3 years or more without any signs of corrosion whatsoever. In fact, in our test spas the heating elements have been inspected on an annual basis with no corrosion damage.

What about CYA and does it prevent corrosion?

This can be a controversial subject but here is the reality. CYA is not recommended for spa use because it lowers the ability of the chlorine to oxidize which is measured by ORP – Oxidation Reduction Potential. This can be witnessed in any pool or spa with an ORP controller. With a spa, the hot water will degrade the chlorine faster than sunlight and since I rarely ever see a hot tub that isn't covered, why use it? CYA itself has a

corrosive nature but it does lower oxidation levels which could potentially be beneficial with high levels but it also requires higher levels of chlorine to effectively sanitize. If you use CYA in a spa, it will take more chlorine to keep it sanitized. Very high levels of chlorine will cause corrosion.

Conclusion

Chlorine generation can be a very good alternative to traditional chemical treatments. It is a proven technology that is safe, effective and economical. We welcome any questions or comments. Please submit to support@spachlorinator.com.