CITY OF NORTH RICHLAND HILLS
CONSUMER HEALTH DIVISION
Frequently Asked Questions about Cyanuric Acid and Stabilized Chlorine Products in Pools/Spas

Summary of Recommendations

- Cyanuric acid and stabilized chlorine (dichlor or trichlor) may be used in outdoor swimming pools only. It must not be used in indoor swimming pools, therapy pools, spas and hot tubs, or in pools using a bromine sanitizer.
- **Cyanuric acid levels must never exceed 90 ppm.** Chlorine cannot kill or deactivate disease-causing microorganisms at cyanuric acid levels of 90 ppm and above.
- Ideal cyanuric acid levels in pool/spa water are between 20-50 ppm. Cyanuric acid levels must not exceed 15 ppm if the pool is being hyperchlorinated to kill *Cryptosporidium.*
- Both dichlor and trichlor release cyanuric acid to the pool water and it is never necessary to put additional cyanuric acid into a pool that uses dichlor or trichlor. If chlorine residuals are low but cyanuric acid levels are high, the operator should increase chlorine residuals by adding **unstabilized chlorine**. Always read and follow the label directions for any chemical.
- Pools that use cyanuric acid must maintain a free chlorine residual of 2 parts per million (ppm).
- Cyanuric acid levels should be tested at least once a week and before any additional cyanuric acid is added.
- Draining the pool/spa water (partially or completely) or using a specially-designed commercial product correctly are the only ways to reduce cyanuric acid levels.

Frequently Asked Questions:

1. **What is cyanuric acid? –** Cyanuric acid is a weak acid that is marketed as a chlorine "stabilizer" for swimming pools. Other terms used by the pool supply industry are "isocyanurates", "conditioner", or "CYA". Chlorine products that are marketed as "stabilized" chlorine also contain cyanuric acid. Chlorine products that are marketed as "unstabilized" do not contain cyanuric acid. When exposed to the ultraviolet rays of the sun, the free chlorine in the pool water will break down and escape. Cyanuric acid is intended to reduce this loss of chlorine.

2. **What are dichlor and trichlor? –** Dichlor and trichlor are two solid chlorine compounds that are widely used as disinfectants in swimming pools. Both contain chlorine as well as cyanuric acid and are often marketed as "stabilized" chlorine. Dichlor usually comes in a granular form

and is marketed for the residential swimming pool market. It is not often used in commercial pools because it is unsuitable for commercial disinfectant feeders. Trichlor is often sold in a tablet or stick form for use in an erosion feeder for small commercial pools, such as those at hotels and motels. Both dichlor and trichlor release cyanuric acid into the water, so it is not necessary to add cyanuric acid to a pool that uses either of these compounds as the primary disinfectant.

3. **So what does cyanuric acid do? –** Basically, cyanuric acid acts as a "sunscreen" for chlorine. Cyanuric acid forms a weak "bond" with the free chlorine in the water, effectively trapping it from escaping and protecting it from the sun's UV rays. Properly managed, cyanuric acid has been shown to reduce the amount of chlorine that needs to be added in order to maintain the minimum residual in an outdoor pool. In a small pool with a moderate bather load, cyanuric acid can significantly reduce the costs spent on chemical disinfectants.

4. **Is there a trade-off? –** Yes, by forming temporary bonds with the free chlorine, cyanuric acid will reduce the overall effectiveness of the chlorine. The amount of time it takes to kill bacteria can be significant increased with the use of cyanuric acid. For this reason, the Model Aquatic Health Code and NRH ordinance mandate that all outdoor pools which use cyanuric acid as a stabilizer maintain a minimum free chlorine residual of 2 parts per million (abbreviated ppm or 2 mg/L).

5. **I have an indoor pool. Should I use cyanuric acid?** – No; cyanuric acid is not allowed to be used in an indoor pool. Remember that cyanuric acid is intended to reduce the loss of free chlorine that is caused by the sun's UV rays. Indoor pools are not exposed to direct sunlight and therefore, there is no benefit in using cyanuric acid or trichlor or dichlor in indoor pools.

6. **How much cyanuric acid should be used in a swimming pool? –** Chemical suppliers recommend that the optimal range for cyanuric acid is 30-50 ppm, although a study published by the University at California at Davis indicates that there is still significant savings in chemical costs in levels as low as two or three parts per million. Other authorities recommend about 20 ppm for a good cost-to-benefit ratio.

7. **How much is too much cyanuric acid? –** At levels above 50 ppm, pools reach the point of "diminishing returns" where the reduction in chlorine effectiveness and cost of buying cyanuric acid outweighs the benefits. ***Cyanuric acid levels above 90 ppm are prohibited in NRH because at these levels, the effectiveness of chlorine is severely diminished and the chlorine cannot deactivate disease-causing microorganisms in the pool water.***

8. **What are the effects of higher levels of cyanuric acid? –** As the level of cyanuric acid rises, the effectiveness or "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. The chlorine can no longer deactivate disease-causing microorganisms, and people can get sick when they are exposed to the water. Problems such as increased cloudiness in the pool water, high bacterial test results, and even algae growth can also occur.

9. **Should cyanuric acid be used in hot tubs or spas? –** No. Cyanuric acid is not allowed to be used in hot tubs or spas.

10. **How does one test for cyanuric acid?** – Any pool operator who is interested in using cyanuric acid or stabilized chlorine should purchase a cyanuric acid test kit from his/her pool chemical supplier and be sure that they understand how to use it properly. The best way to manage the problems that come with too much cyanuric acid is to avoid them by testing the cyanuric acid level regularly and ensuring that the levels never exceed 90 ppm. Cyanuric acid levels should be tested at least once a week. Never add more cyanuric acid before checking the current level.

11. **My pool has cyanuric acid levels above 90 ppm, how can I reduce them?** – Unlike chlorine, cyanuric acid is never "used up". Once you have added cyanuric acid to the pool water, it will remain in the water. Adding more cyanuric acid will continue to increase the levels. The best way to reduce cyanuric acid is to partially drain the pool and add fresh water. Keep in mind that cyanuric acid tends to concentrate more near the surface of the pool water, so draining from the top of the pool will remove more cyanuric acid than draining from the bottom of the pool. Note that some cyanuric acid can cling to the sides of the pool and to the plumbing and filtration system, so even after completely draining and refilling the pool, there will probably still be detectable levels of cyanuric acid in the water. For this reason, it is also better to brush the sides of the pool well while draining to remove as much cyanuric acid as possible.

    Recently, commercial products have become available that can be added to the pool/spa water and claim to reduce cyanuric acid levels. It is important to read and follow the label directions of these products to make sure that the water chemistry of the pool water is adjusted properly before adding the product. Most of the time, these products will take some time (usually 10-14 days) to reduce cyanuric acid levels to acceptable levels. It is important to take the cost of the product, the time that the aquatic facility will be out of commission, and the cost of replacement water into account when deciding whether to drain the pool or use a commercial product.

12. **My pool uses bromine as a disinfectant, should I use cyanuric acid? –** No; bromine does not experience the same breakdown when exposed to sunlight that chlorine does. There is no benefit to adding cyanuric acid to a pool that uses bromine as the primary disinfectant.

13. **I have another question. What do I do?** Contact your Consumer Health inspector at 817-427-6650 or consumerhealth@nrhtx.com. Your inspector can answer your question or direct you to resources that will be able to help you find an answer.

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