CYA, the chemical compound known as pool stabilizer, can prove to be anything but stable.

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It's Not What You Think

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CYA, or cyanuric acid – also known as stabilizer or conditioner – is a stark reminder of the old adage that more isn't always better. A little stabilizer goes a long way! Economically and operationally, if used at the correct levels, stabilizer can play an important role in helping to reduce excess chlorine use. However, too much can be downright dangerous and will contribute to common operational problems with your swimming pool. This article provides a bit of background on stabilizer and a further explanation on the benefits and dangers.

DIFFERENT KINDS OF STABILIZER

Stabilizer only enters pool water in two ways: It is either manually added intentionally by the pool operator, or it is added somewhat unintentionally through the use of chlorination products that contain it. Stabilizer may be purchased as a separate product from most pool chemical suppliers, and it is sold primarily in powder or granular form, which is slowly dissolved by the pool operator directly into the pool. Powder is often preferred because it will dissolve more quickly.

Stabilizer in pool water can also be a byproduct of using "stabilized chlorine" products commonly known as trichlor tablets or dichlor powder. These products were designed intentionally to introduce stabilizer and chlorine at the same time; however, they were intended for low-use pools like single-family backyard swimming pools that don't use a lot of chlorine.

Unfortunately these products introduce too much stabilizer for commercial pools, due to the high chlorine demand, as compared to residential pools. For example, one eight-ounce trichlor chlorine tablet contains roughly four ounces of chlorine and four ounces of stabilizer, or 50 percent stabilizer by volume. Don't be fooled by the "90 percent available chlorine label" – that isn't measured by volume and doesn't indicate how much stabilizer is in the product.

For each pound of trichlor that is added to a pool, one pound of stabilizer is added as well. One pound of stabilizer in a typical 25,000-gallon multifamily pool adds 5 ppm of stabilizer. If this average pool uses one 50-pound bucket of trichlor tablets per month on average, then the stabilizer level can reach 250 ppm in just one month – twice the legal limit in Texas and five times the threshold for recreational water illness control recommended by the Centers for Disease Control!

Pool experts recommend only 10-20 ppm stabilizer in outdoor pools. This level helps to slow the deterioration of chlorine in the pool water due to sunlight, but it isn't enough to seriously degrade the sanitizing power of the chlorine. Except in very specific and rare cases, stabilizer should never be used in indoor pools and is often prohibited by health authorities.

STABILIZER LIMITS

Most health departments set limits on stabilizer in commercial pools. In the Texas the current limit is 100 ppm, but many states and proposed national standards are moving toward 50 ppm. Why? Because at levels above 50 ppm, according to the CDC, recreational water illness control may not be possible* and because there is increasing evidence that stabilizer levels much above 20 ppm slow down the sanitation process and add no value in reducing free available chlorine use.

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In addition to limiting the effectiveness of chlorine against bacteria, excess stabilizer inhibits chlorine from killing algae, which will result in a green pool. Green pools that occur even when there is adequate free chlorine in the water are often due to high stabilizer. The only way to fix this is to reduce the stabilizer level or increase the chlorine level, which, of course, becomes a never-ending cycle. Soon enough, one or both will be beyond the legally allowable levels.

MEASURE AND TEST

To test the stabilizer level in your pool you can use most standard pool test kits; however, most of them will test to a maximum level of 100 ppm. Some test strips can test much higher levels. Your regular test kit is probably acceptable. If the level is over 100 ppm, it really isn't too important to know exactly how high it is – action must be taken to reduce it.

What is a pool operator to do if too much stabilizer is determined to be in the pool? Stabilizer isn't "used up" like so many other pool chemicals. It will stay in the water until it exits with the water, either through backwashing, splash-out or a leak. To reduce the stabilizer level intentionally, a pool must be drained and refilled with fresh water. This can get very expensive, and many people dislike the environmental impact. Additionally, the pool will have to be re-chlorinated and balanced with other chemicals once it is refilled. It is certainly best to avoid frequent draining if possible, but once the stabilizer level exceeds guidelines there is no choice.

It is also important to note that with extreme high levels (say 150 ppm or more), the pool may need to be drained multiple times to reduce the level to an acceptable and safe range. It is thought that stabilizer gets "attached" to plaster, filter media and perhaps even piping materials.

ALTERNATIVES

Of course, if possible it is best to completely avoid the use of stabilized chlorine products like trichlor in commercial pools and eliminate the potential for stabilizer build-up to begin with. This way, the correct level of stabilizer may be added to keep the pool operationally and economically efficient while avoiding the danger and operational problems of overstabilization.

Some alternatives to consider are any non-stabilized chlorine products like sodium hypochlorite (liquid chlorine bleach), elemental chlorine produced by a chlorine generation system, calcium hypochlorite or lithium hypochlorite. Of these options, sodium hypochlorite is the most common, cost effective and safest where it is available for bulk delivery to commercial pools.

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* *http://www.cdc.gov/healthywater/pdf/swimming/pools/hyperchlorination-to-kill-cryptosporidium.pdf*