



INFORMATION RELEASE

Synergy Technology for Pool, Spa, & Fountains

Algaecide & Algaestat Treatments' Comparison Report:

How they function, advantages and disadvantages they offer by killing, preventing, and controlling algae.

Note: this information is provided as a simplified reference and not a definitive report.

Chlorine: Is both a sanitizer and algaecide. Products are available in many types' inorganic and organic forms of dry (trichlor) and liquid inorganic (sodium hypochlorite) for example. Chlorine is very pH sensitive and water reactive. Its primary function is an oxidizer and sanitizer, not an algaecide except at very high levels. *How it works* - when the compound is added to the water, the chlorine reacts with the water to form various chemicals, most notably hypochlorous acid. Hypochlorous acid kills bacteria and other pathogens by attacking the lipids (protects the external cell) in the cell walls and destroying the enzymes and structures inside the cell through an oxidation reaction. Chlorine essentially kills algae through aggressive oxidation in swimming pool water.

EPA registration required.

Advantages: Very cost effective, general ease of handling, stabilized form lasts longer than sodium hypochlorite, gas chlorine and bromine sanitizers.

Disadvantages: Very pH sensitive, chloramine byproducts, and not a good algae killer at low dosages, corrosive to surfaces, and negative effects to the atmosphere.

Silver: Is a metallic liquid type algaecide and bactericide that lasts up to several weeks depending on pH levels of pool water. Silver algaecides are both algaecide and algaestat. Silver products are most effective against black fungi (aka algae) and bacteria (esp. pink type).

How is works - Silver interferes with essential metabolic activities in algae and bacteria cells. Silver basically kills algae as a poison. In high dosages, may stain surfaces grey or black under conditions of high pH water and/or reactions with sunlight. EPA registration required.

Advantages: Fast acting on black fungi and broad range of bacteria.

Disadvantages: pH and sunlight sensitivity, stain potential above pH 8.0, and not for salt cell pools – interferes with salt cell metals.

Quaternary ammonia: Quats (dimethyl benzene ammonium dichloride compounds) are organic, liquid type algaecides – they foam and kill algae as a contact killer. Very high dosages in water will also kill bacteria. They have a short 24 hour life-span – here today, gone tomorrow. Quats are algaecides only, not algaestats as they are sometime incorrectly called. They are moderately effective algaecide and best used to kill green algae. *How it works – Quats penetrate living cells and kill by way of poisoning the organism or disrupting a vital life process. They are designed to act quickly and dissipate quickly.* EPA registration required.

Advantages: Low cost and readily available. Salt pool friendly but reduces chlorine residuals.

Disadvantages: Creates a chlorine demand, 24 hour limited effectiveness.

Copper: Is a heavy metal, liquid algaecide, fungicide, and bactericide. Copper products are both algaecide and algaestat. One of the most popular algaecides used. They are effective on all types of algae. Chelated form of copper lasts longer – up to several weeks or more depending on water pH. *How it works - The toxic action of copper is attributed to its ability to denature cellular proteins and to deactivate enzyme systems in fungi and algae. Copper especially poisons algae.* Copper has a tendency to stain blond swimmers hair and plaster surfaces with a light blue/green color if it precipitates out of solution. EPA registration required.

Advantages: Low cost, most effective for green and black type algae, widely available, and works within 24 hours – green algae.

Disadvantages: pH sensitive, stain potential above pH 8.0, environment issues, and *not for salt cell pools.*

Polyquats: Liquid algaecide and algaestat for killing and preventing algae growths. Typically available in 30% and 60% concentrates. These products do not foam, contain no metals, and effectively clarifies pool water. *How it works - kills and controls the growth of algae and microorganisms by disturbing their normal metabolic process of the living cell. Positive charged polymer attaches itself to the algae or bacteria cell walls and blocks the inflow and outflow of nutrients and waste causing cell death within hours. Kills algae with or without chlorine. Polyquats basically kill and prevent algae by suffocation.* Polyquats were originally developed for cooling towers and are a multi-task treatment for swimming pools. A less known fact about Polyquats are there significant benefit to water treatment if use in small weekly dosages. It is one of the most useful algaecides in the swimming pool industry. EPA registration required.

Advantages: Broad spectrum algaecide against green and yellow algae plus black algae (fungi). Does not create a chlorine demand. Powerful water clarifier. Salt pool friendly.

Disadvantages: Higher cost than some algaecides. Lasts one to two weeks only.

Algaestat Treatments: (products that do not kill algae)

Sodium Bromide: Bromides (dry or liquid) not bromine sanitizers act as an inorganic algaecide and chlorine enhancer. When properly “converted” to bromine they are used to kill green and yellow type algae as well as assist. *How it works - Sodium bromide (salt) is used to supply bromide ions to the water so they may be oxidized or changed into hypobromous acid, the killing form of bromine. Used as a disinfectant, bromine itself is a sanitizer and disinfectant for water; it contains a catalyst in order to oxidize water. Bromide itself cannot oxidize, bromide is a compound of bromine and an oxidizing agent, which is often chlorine (many pool owners and even pool professionals do not realize that chlorine is often an ingredient in bromine). In other words, to be effective, bromide requires a catalyst, and the*

catalyst is often chlorine. Remember, once bromide is added to a chlorine pool it becomes a bromine pool – unless you drain the pool. Once you have created a bromine pool, you need to know how to properly test, treat, and know how to maintain it. There are advantages. The ones listed below only pertain to bromide initially as an algicide. EPA registration required.

Advantages: More effective at higher pH readings. Kills yellow and green algae.

Disadvantages: Creates a chlorine demand - due to the fact that bromide is not protected against destruction by the Sun's UV rays causing higher chlorine consumption. Not for salt pools.

Phosphate Removers: Lanthanum carbonate and lithium chloride compounds aid in controlling algae by removing one of their primary food sources which are phosphates. They are not algicides nor are they algaestats. *How they work:* *They function essentially by chemically reacting with and removing ortho-phosphates from pool water in an effort to maintain phosphate levels below 125 part per billion (ppb). Basically, phosphate removers prevent algae by starving them of phosphate.* Note: Manufacturers of these products claim that phosphates enter pool water primarily from fertilizers, rainwater, soaps, decaying vegetation and other pollutants. More recent research negates this exaggerated claim. Most source water tested in the United States contains natural phosphates from 20 ppb to 80 ppb and some as high as 300 ppb. The “primary” source of excessive phosphates in pool water come from phosphonate based (organic phosphates) scale and stains inhibitor products. No EPA registration required.

Advantages: Properly used – helps to remove excessive phosphate buildup to reduce algae growths.

Disadvantages: High cost. Overused. Sunlight and nitrates in water can also cause algae blooms.

Potassium Tetraborate: This dry chemical is not an algicide but an algaestat against algae growth and helps to keep pool water clear. *How it works - When added to the pool water in proper dosage, it prevents algae from converting or processing carbon dioxide into the fuel it needs for growth – borates essentially starve algae of carbon dioxide.* It is also conditions pool water for less chlorine usage, makes the water feel softer and ease of maintenance.

EPA registration required.

Advantages: Prevents algae, easier pool maintenance, and reduces chemical consumption up to 50%.

Disadvantages: Potential high cost for quantity of material required (approx. 2 lbs. / 1,000 gals.)

Please direct your questions and comments to:

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