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Mineral Supplements

Mineral-based sanitizers have made inroads into the pool industry. Take a look at what they do and how they work.

For many service technicians, non-electrical, mineral-based sanitizing products have become a viable alternative to systems based on chlorine.

A mineral can be defined in a number of ways. But most agree it refers to substances that are naturally occurring and consist of inorganic elements that can be mined from the earth. Silver is the key mineral in pool sanitizing products because of its ability to control potentially harmful bacteria in the water.

According to the Silver Institute, the medicinal and fluid purification properties of silver have been recognized for thousands of years. Early Phoenician records noted that water kept in silver vessels tended to remain cleaner. In fact, Hippocrates, the father of modern medicine, is said to have promoted silver's anti-disease properties. However, the mechanism of water sanitation by silver was not understood until approximately 100 years ago, when it was proven that silver could kill bacteria and algae.

Today, silver is used in a number of pharmaceuticals and medical devices. The devices have gained marketing approval from the Food and Drug Administration — and the Environmental Protection Agency regulates products in a variety of applications that control bacteria.

Let's take a look at how minerals are utilized in swimming pool water:

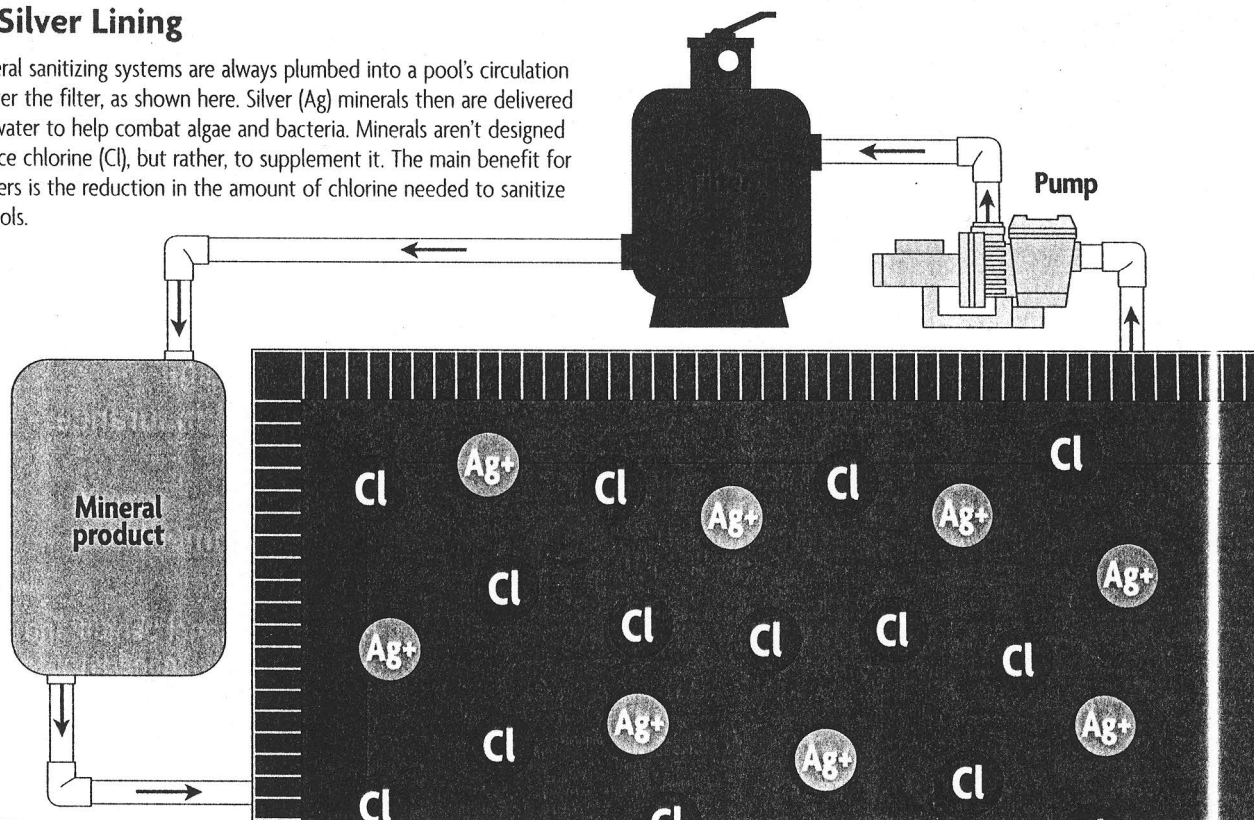
Silver and copper

Silver is toxic to bacteria, but only in

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The Silver Lining

Mineral sanitizing systems are always plumbed into a pool's circulation after the filter, as shown here. Silver (Ag) minerals then are delivered to the water to help combat algae and bacteria. Minerals aren't designed to replace chlorine (Cl), but rather, to supplement it. The main benefit for consumers is the reduction in the amount of chlorine needed to sanitize their pools.



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the ionic state and after prolonged exposure. It is uniquely harmful to bacteria as the result of its accumulation within the cells, where it can interfere with life processes such as respiration, nutrient utilization and reproduction of these microorganisms. Published reports from researchers at the University of Arizona confirm that when it is combined with reduced concentrations of chlorine, rates of silver accumulation and bacteria destruction are accelerated.

Besides silver, another mineral used to help prevent algae growth is copper. One product currently on the market includes copper in its mineral formula, while another offers it as an option through a secondary product.

Minerals do not replace chlorine as a sanitizer, but rather, supplement it. The main consumer benefit of mineral

technology in a pool is to reduce the amount of chlorine needed. The problems associated with chloramine buildup, such as irritated eyes and skin, are minimized. In addition, less chlorine means the water will be easier on the pool's equipment and surfaces.


Of the two mineral sanitizers currently registered with the EPA, one uses a colloidal form of silver released into water from ceramic beads. The other is a silver salt with a controlled release mechanism, which is applied to calcium carbonate granules that help neutralize pH.

When incorporating minerals into your sanitization regimen, the chlorine levels may be reduced to as low as 0.5 ppm. There are two ways manufacturers deliver chlorine support to the pool water: One product uses a prefilled chlorine pack, while another incorporates hand feeding or the use of a secondary chlorinator.

Both methods work in conjunction with a salt-chlorine generator as the sanitizer source. If it is turned down to generate less chlorine, the salt generator doesn't need to work as hard. This results in an electrolytic cell with a longer life.

Check for the EPA label

When these mineral-based sanitizers were introduced to the marketplace several years ago, the EPA labeled them "devices." It did not require that they go through the registration process. Today it's a different story: No company can sell a mineral sanitizer without being registered with the EPA.

When considering any non-device sanitizer product, make sure it has an EPA registration number. If a product makes sanitizing claims — such as killing bacteria without an EPA registration number — it is doing so against regulations. 

Moment of Clarity

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This incident shows the importance of maintaining water clarity at all times.

Following is an examination of some useful water clarifiers and how they work.

Clear standards

It is important to understand exactly what "clear" water is. There are standards for water clarity in public pools, which are based on drinking water standards by the National Sanitation Foundation. The NSF standard is 0.5 NTU. At times of peak bather loads, turbidity may increase to 1.0 NTU, but must return to 0.5 NTU within six hours following peak use. In addition, most state health departments require that the main drain be clearly visible from the pool deck at all times.

Water clarification is accomplished by the removal of suspended particulate matter from pool water. This includes things such as:

- Silt
- Organic matter
- Algae
- Suntan oils, lotions, etc.
- Bacteria and protozoa
- Minerals and metals

One of the best ways to cope with these invaders is to use clarifiers. Let's take a closer look:

Coagulants and flocculants

To achieve clarity, there are two primary ways that silt, algae, organic matter and the like can be removed from pool water. Filtration is the obvious first method. The second method is chemical treatment.

Chemicals help deal with many different contaminants present in pool and spa water. Standard chemical treatments are effective at breaking down organics, microorganisms and algae. Some of the chemical methods for achieving water clarity include sanitizing, shocking and oxidation. Here, however, we will discuss two popular clarifiers: coagulants and flocculants.

The reason these clarifiers were created is because after filtration, sanitizing and oxidation, some small micron-sized particulate can still remain in the water. While the pool can appear clear, it may have small, suspended particulates contributing to the turbidity of the water — it can still look "flat" or "dull."

Clarifiers, sometimes referred to as water polishers, can help with that.

How they work

Clarifiers such as flocculants and coagulants are a type of a polymer, with a positive ionic charge. A polymer is a long

molecule chain with many positively charged hooks throughout. The particulate material in pools is mostly negatively charged ions. Opposites attract and the small, negatively charged particles are caught in the positive hooks and are held. This process is known as "coagulation." While coagulation causes the formation of larger, more filterable particles, the process is still not complete.

Flocculation, the formation of larger, more easily filtered particles, is accomplished by a process known as "bridging." Bridging is the effectual gathering of coagulated masses into even larger bundled particles.

One analogy comparing coagulation to flocculation would be to imagine the difference between a minivan and a military transport plane. The minivan (coagulation) is able to pick up passengers and transport them. The military transport plane (flocculation) is able to pick up several minivans' passengers.

Many clarifiers coagulate, but not all completely flocculate. For example, synthetic polymers are petroleum-based and therefore cannot remove or flocc oils.

When selecting a clarifier, go for one that is proven to remove organics and oils through a complete coagulation and flocculation process. 